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BY J. W. TUDOR THOMAS, M.D., B.SC. WALES, M.S. LOND., F.R.C.S. ENG.,

HONORARY ASSISTANT OPHTHALMIC SURGEON TO THE CARDIFF ROYAL INFIRMARY; CLINICAL TEACHER IN OPHTHALMOLOGY IN THE WELSH NATIONAL SCHOOL OF MEDICINE.

THE history of corneal transplantation dates back to 1813 when Himly made the suggestion that transplantation of cornea from one animal to another might be done. An operation of this nature appears to have been performed for the first time in 1818, 112 years ago, by Reisinger, who removed the whole of a rabbit's cornea and reapplied it with the lids closed. Following this attempt, many others tried similar operations, but Dieffenbach in 1834 summarised the position by stating that in his opinion the transplant would either fail to adhere, or, if it did adhere, it would become opaque.

Earlier Attempts.

These early attempts were of course made without the advantages of more recent knowledge of anæsthesia and asepsis; Bigger in 1835 performed an operation for corneal transplantation on a gazelle, and describes how the animal had to be fixed in a box, but in spite of this, its struggles rendered the operation very difficult. Bigger also operated on rabbits but was much disappointed with the chances of retaining transparency in the graft. He appears, however, to have had one successful result, which he attributed largely to the use of bichloride of mercury solution after the graft became adherent. Some other operators about this date reported more encouraging results, but Feldmann in 1844 published a paper on the subject in which he cast considerable doubt on the sincerity of these reports. Feldmann's own experience was, that of 20 cases operated on, seven united and all these were opaque.

Kissam in 1844 described how he attempted to transplant a portion of the cornea of a pig on to the staphylomatous eye of a man but without success; he cut the graft larger than the gap to be filled, the reason being, to quote his own words, ". . . . from the delicacy of the parts, it would be utterly impracticable to fit, in an aperture, a piece of foreign substance equally delicate." In regard to the absorption and disappearance of the graft that he transplanted, he says, ". . . . I believe that had the internal structure of the eye been perfect, no absorption would have occurred, because what is necessary is generally preserved; unnecessary parts nature does not long preserve."

At the International Ophthalmological Congress held in London in 1872, Henry Power, of St. Bartholomew's Hospital, read a paper on Transplantation of the Cornea; his own attempts on animals and men were unsuccessful, although in one case he describes the graft as being tolerably clear. He used at first a cork-borer for removing the graft, and later used a steel punch. The cats and the rabbits that he operated on all died of pyæmia.

Von Hippel in 1886 published the results of 12 years' work on transplantation of the cornea and came to the conclusion that if the whole thickness of the cornea was removed, the aqueous found its way between the curled up cut ends of Descemet's membrane and infiltrated the graft, causing it to become opaque. He therefore gave up the whole thickness operation in favour of an operation by which only the superficial layers of the cornea were removed, retaining Descemet's membrane intact. He appears to have had success operating in this way, utilising his trephine for marking out the graft, and taking the graft from the cornea of a rabbit. He claimed that after all the attempts made to that time, he had shown the possibility of transplanting cornea with some measure of success, and remarked on the scientific interest of an answer to a question which had occupied in vain for 60 years the most eminent surgeons.

Fröhlich in 1893 operated by von Hippel's technique on six men, but all the cases were failures, and Cole in 1894 said that trephine methods were so unsatisfactory that few continued to use them and considered that it was impracticable to remove the cornea down to, but not through, Descemet's membrane. He suggested that the graft should be definitely larger than the gap into which it was to be placed, and that the eye of a dog should be removed to provide the graft.

The difficulty of doing von Hippel's operation led to experiments in which the insertion of an artificial cornea made of celluloid or glass was tried, but they were useless. Zirm in 1906 obtained a transparent graft which was held in place by a stitch passing over it, and Magitot in 1912 said that there were about half a dozen successes in corneal transplantation in the history of 100 years; he thought that the best results were obtained with partial thickness grafts, and Walker in 1917 thought that perforating the anterior chamber was the leading cause of failure.

Ebeling and Carrel in 1921 reported one clear graft in a cat. Fuchs in 1923 reported two clear grafts out of 28 cases, and Elschnig in 1923 reported nine clear grafts out of 92 cases. Ask published one successful case in 1921 and another in 1925. Frieberg in 1928 refers to the successes obtained in some cases by Elschnig and Magitot when using a partial thickness bed for the graft but comments on the technical difficulties in preparing such a bed, as well as the difficulty of determining the transparency of the deeper layers of the cornea before the operation. Frieberg gives his own experience of penetrating corneal transplantation comprising nine operations, two of which resulted in good vision; the grafts were cut with trephines, and were either equal in size to, or larger than, the gaps prepared for their reception. Elschnig in 1930 published his experiences of 20 years of corneal grafting. He used von Hippel's method of penetrating corneal transplantation with a mechanical trephine. The graft is placed into the gap prepared for it in the cornea, and a suture from the conjunctiva is laid over it for two days. He had performed 174 operations of this nature up to July, 1929, and his results are a great advance on those of previous workers. He obtained 34 clear grafts out of his 174 cases, while 39 were only partially cloudy. Cases of interstitial keratitis proved to be the most successful in his experience, as he obtained 17 clear grafts out of 26 cases operated on. He operated on 113 cases of opacities in the cornea following burns or ulcers, and obtained 15 clear grafts, but in 22 cases the graft failed to unite.

New Experiments.

My own experimental work on this subject commenced in May, 1922, and for the past eight and a half years I have carried out many experiments on rabbits

* Hunterian Lecture delivered before the Royal College of Surgeons of England on Jan. 23rd, 1931.

in order to investigate the factors which influence the union and healing of corneal grafts, and, if possible, to determine a method by which transplantation of the cornea can be successfully performed. The experimental work has all been done in the physiological department of the Welsh National School of Medicine at Cardiff (assisted from June, 1930, by a grant from the Medical Research Council). I would like to express my indebtedness to Prof. Graham Brown, the head of that department, who has so kindly provided me with every facility for the performance of the experiments. The experiments were carried out on healthy rabbits, and consisted of transplanting either the whole or part of the cornea. The grafts were of the whole thickness of the cornea and were obtained either from the rabbit operated on or from another rabbit.

Many operative procedures were tried, and much better results were obtained by one method than by others. When this work was begun in May, 1922, it was recognised that the problems which were to be solved were difficult and had been universally regarded as such, and indeed the results of previous workers on the subject of corneal transplantation had not indicated any definite lines upon which the experiments should proceed. I propose now to give a short account of 92 experiments that I have carried out for corneal transplantation. These will be divided into six main groups, according to the type of operation performed.

FIRST TYPE.

This group consists of seven rabbits. In one of these, the graft consisted of a horizontal strip of cornea with a conjunctival flap at each end. In the other six the whole of the cornea was transplanted together with a certain amount of conjunctiva. Four out of the seven grafts became united and healed. The cornea in these cases remained fairly transparent for some days and then became clouded. Ulceration took place in the centre of the cornea, and the ultimate state of the transplanted cornea was such that no useful visual function resulted, although there were small areas consisting of partially clear cornea, but the central portion of the cornea was opaque. The widest portion of more or less clear cornea was about 3 mm., and on this account the grafts in the next group of experiments were made about 6 or 7 mm. square.

SECOND TYPE.

This group consists of 17 experiments, the common factor being that the graft was either central or paracentral and was held in place by stitches passing through the margin of the graft and the margin of the adjacent cornea. One of the rabbits died at the sixth day, and so has to be discounted. Of the remaining 16 grafts, nine united and seven failed to unite. None of these was clear but in two of them the opacity was not dense and could be described as nebulous. The remaining seven were opaque. There was a definite tendency for the iris to become adherent to the cornea, and it was noted that when this occurred opacity of the cornea invariably resulted. The insertion of stitches into the graft is inevitably accompanied by a certain amount of damage to the graft itself, and to minimise this damage various devices were tried by which the graft was supported—e.g., on a piece of linen tightly stretched over a small drum—to counteract the pressure of the needle and to avoid the necessity of gripping the edge of the graft with forceps. It is interesting to note that Bigger, in 1837, used a cork in a similar way to counteract the pressure of his needle.

It was also noted that there was a great tendency, when stitches were inserted to develop a line of tension across the graft in one direction or other, which was evident at the end of the operation. This line of tension made one or two stitches cut out, so that a portion of the margin of the graft did not unite. In every case this part of the graft became swollen, and even after union had taken place was quite opaque, while in some cases the separation of the graft would increase from this spot, so that it became more or less completely detached.

THIRD TYPE.

This group consists of seven rabbits in which no stitches were used to secure the graft in place, and the margins of the graft were cut in a shelving manner in the belief that in this way union would more readily take place on account of the increased area of the cut surfaces in apposition to each other. All the grafts were autoplastic, and a Gillette razor blade was used for the removal of the graft. The graft was pressed on to the bed prepared for it, and after a few minutes' interval a drop of sterile olive oil was placed on the surface.

Of the seven grafts, four became united while three failed to unite. Of the four grafts that united, one was opaque with an adherent iris; one, in which the iris was not adherent, was just nebulous; in another, a portion of its margin was raised and white at the eleventh day and the graft became practically opaque. In the remaining one, the lower margin was separated soon after the operation and the iris was adherent; four years later the lower two-thirds of the graft was opaque, while the upper third, to which the iris had not been adherent, was clear. There was a tendency in all these grafts for slight bulging to take place on account of the intra-ocular tension. The opacity that resulted in these grafts was mostly in the deeper layers, while the superficial layers and the surface epithelium tended to be transparent.

These seven experiments showed that a graft can adhere fairly well when the edges are cut in a shelving manner, even when no stitches are used to secure it in place, and even when olive oil is applied as a lubricant to the graft soon after the operation.

The results up to this stage had been so poor that I was prompted to perform an experiment with the object of determining whether, by retaining a minute pedicle of corneal tissue, it was possible to keep a graft transparent.

An incision was made in the cornea of a rabbit, in the form of a rectangle, penetrating the whole thickness of the cornea but retaining at the posterior superior corner a pedicle 2 mm. in diameter. The sides of the rectangle measured 7½ by 4 mm., and its position was across the centre of the cornea. The flap was then secured in place by four stitches. The flap united well and in time became transparent with the exception of a marginal scar.

The pedicle was only 2 mm. wide, and yet this small amount was sufficient to enable the graft to live and to remain transparent.

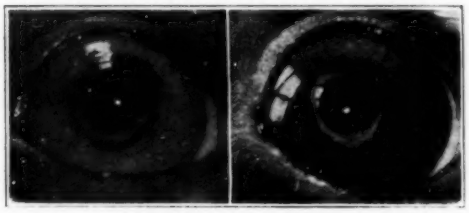
Observations on the return of sensation to the graft showed that three weeks after the operation the 2 mm. pedicle allowed sensory nerve impulses to pass from an area measuring 3½ by 2½ mm. After that time the sensitive area extended by 1 mm. every fortnight, so that the remaining 5 mm. of graft regained its sensitivity in 70 days.

The animal was killed two years and four months after the operation. Microscopic examination showed that a new membrane had been formed behind Descemet's membrane, fusing with its posterior surface; this new membrane was formed over quite a large area, and where it passed from the graft to the adjoining cornea it gave an appearance as if the graft's Descemet's membrane had split into two layers.

This experiment shows what a great difference there is between a complete and an incomplete detachment of a portion of cornea, and how the retention of even

a small pedicle of corneal tissue is a material help in revitalising the graft. If this small 2 mm. pedicle had not been retained, my own experience experimentally is that with the same method of stitching as that employed in this case the graft would have been opaque, whereas actually it was clear, except for a marginal scar.

FIG. 1. FIG. 2.



Two clear grafts in Group A at 14 months.

Wolfe in 1872, when operating on a case of traumatic cataract, found that his incision in the cornea had nearly completed the third side of a triangle, the other two sides of which were formed by corneal wounds, the presence of which he had overlooked. This little triangular flap with a small pedicle also became united and remained clear.

FOURTH TYPE.

This group consists of 18 rabbits, the graft in each case being taken from the margin of the cornea, triangular or quadrilateral in shape, and united to the cornea by stitches; a wide iridectomy was performed with the object in view of preventing adhesion of the iris to the graft. In 13 of the 18 rabbits the grafts became united and in five they did not take. Two out of the 13 did not live long enough for the ultimate results to be observed, but of the remaining 11 two showed a clear area for about two-thirds of the graft, while the other nine were opaque. The two grafts with a clear area were the first two to be done by this method, and at first it seemed very encouraging, but although the operations on the remaining rabbits of this group were carried out in a similar way, this good result could not be repeated. One concluded, therefore, that this was not a method that was likely to produce consistent results, and that there was a large element of uncertainty associated with it. In some of the rabbits of this group olive oil was used during the operation, and the results in these rabbits, compared with the others, indicated that the use of olive oil did not add to the risks of failure.

It is interesting to note that out of nine grafts where five stitches, or less, were used, four grafts failed to unite, whereas of the other nine, where six or more stitches were used, only one graft failed to unite.

These results appear to be in agreement with the view already expressed, that the insertion of stitches is liable to produce a line of tension along the graft itself, which is very undesirable. Thus when fewer stitches are used, the responsibility of each stitch is great, and as the effect of a line of tension is to make the stitch cut out a large gap will result, which is likely to lead to complete failure. If more stitches had been used, the responsibility placed on each one would be less, and if a stitch cut out, the gap would be more likely to be small and possibly might not prevent the graft from uniting, although it would prejudice the result in regard to transparency.

In the next group of experiments an attempt was made to secure fixation of the graft without the insertion of stitches into its substance, at the same time providing the necessary support to withstand the intra-ocular pressure.

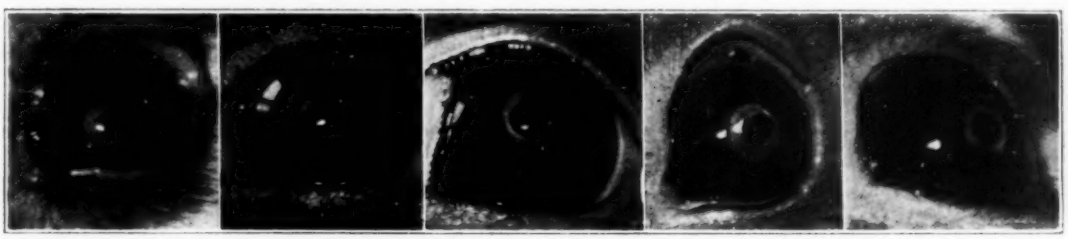
FIFTH TYPE.

Under this heading are included 16 experiments. In each case the graft was secured in place by stitches inserted in the substance of the adjoining cornea and passing over the graft on its anterior surface to take a similar hold in the cornea on the opposite side, the ends then being tied together. In three of these rabbits one stitch of this nature was used to secure the graft in place. Two of these grafts became displaced about the fifth day, and in the case of the third graft one margin at first failed to unite, and although the iris was not adherent, the graft became opaque.

It appeared from these three experiments that there was a tendency for the graft to slip away from the stitches, and that one stitch of this type was not sufficient to secure it in place. For this reason, each of the remaining 13 grafts was secured by two stitches of the type described, passing across the graft at right angles to each other, the two portions of each stitch being parallel to each other. Of the 13 grafts, six became united and seven did not unite. The grafts were homoplastic, and olive oil was used in each case. Of the six grafts that united, one had a clear central area when the animal was killed three months after the operation. This was the only one in which the iris was free from the commencement, and was the only one which had a small clear area, the other five grafts being opaque.

The grafts in these 16 rabbits were square or rectangular in shape, and there was a tendency for a corner of the graft to protrude. The pressure of the eyelids or the nictitating membrane on the protruding portion tended to cause a certain amount of detachment of the graft, and therefore in the next group of

FIGS. 3 4 5 6 7



Five clear grafts in Group D.

experiments a round graft was used. It was found in several of the grafts that one loop or other of the stitches would slip away from the surface of the graft and come to lie in the groove between the graft and the cornea. This was very undesirable, as it interfered with the proper union of the graft at this spot, and consequently in the next group of experiments the stitches were inserted so that the loops of each stitch, instead of being parallel, were made to cross each other.

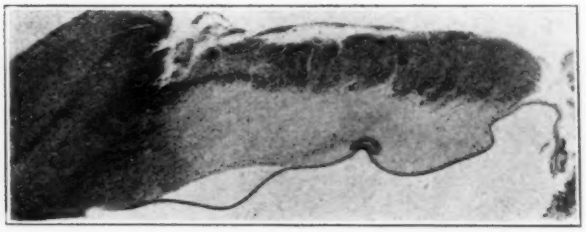
A review of the experiments seemed to indicate that the eighth day was about the optimum time for the removal of the stitches, and in most of the experiments in the next group this was the routine adopted.

SIXTH TYPE.

The grafts to be described under this heading may be divided into four groups. The common factor to all is the method of stitching used to secure the graft in place. This method I have referred to elsewhere as "cross-stitching." Two sutures are used, each taking a grip in the substance of the cornea, passing over the graft to take a similar intracorneal grip on the other side, and the ends tied together so that the loops of the stitch form a cross over the graft. In this way the graft is held down at eight points on the margin, while all the stitches cross at the centre of the graft. By this method it was much less likely that a loop of the stitch would lie in the groove between the graft and the cornea, and the graft would be less likely to slip out of place.

Group A consists of ten rabbits, two of which were killed at an early date for microscopical examination of the eyes, and have to be discounted. The portion of cornea to be grafted was removed with the aid of a Graefe knife and scissors and the gap in the cornea was prepared in the same way. The graft was either equal in size to or slightly larger than the gap, and the margins of both graft and gap were cut in a

FIG. 8.

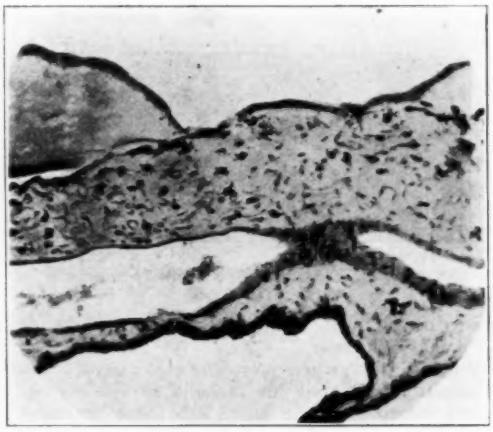


Fourth type. Unsuccessful marginal graft at seven days. Showing loss of superficial layers and invasion from the anterior surface by leucocytes and epithelioid cells. Magnification ×26.

shelving manner. Of the remaining eight, five grafts became united and three were partly detached. Of the five grafts that took one was opaque, one had a small central area of about 2 mm. that was practically clear, one had a central clear area measuring about 2 by 3½ mm., and the other two grafts were clear (Figs. 1 and 2).

The results of Group A indicate that the cross-stitching method is an improvement on the other methods of securing the graft in place. Care has to be taken, however, in tightening the stitches; if they are tied too loosely, the graft is not kept sufficiently firmly in its bed; if they are tied too tightly, the graft is apt to be badly cut by the pressure of the stitches, with consequent harmful effects. It was noted, however, that the graft can sometimes recover to quite a large extent from the cuts caused in this way, and one of the two grafts that had a

FIG. 9.



Sixth type at 14 days. Graft has become displaced. Epithelium has grown over the gap on the surface of the adherent iris. Structure of endothelium in the wall of a blood-vessel in the iris can be seen. Mag. ×91.

central area which was nearly clear had been badly cut by the stitches.

The relative size of the graft and the gap in which it is placed influences the extent to which the graft may be cut by the overlying stitches. If the graft is cut larger than the gap, there is more tendency for it to bulge, and the cutting by the stitches is accentuated.

Realising the importance of knowing the exact size of the graft and the gap in the cornea, so as to be able to make more exact deductions from the experiments, the remaining grafts and the beds in the corneæ prepared for their reception were outlined by trephines of known diameter.

Group B.—The two grafts in this group were outlined with a trephine measuring nearly 5 mm., and the grafts removed by scissors after opening the anterior chamber by means of the trephine. The gap in the cornea was prepared in the same way, using the same trephine. The margins of both the graft and the corneal gap were cut in a shelving manner. Both the grafts became united but neither became transparent; one was definitely opaque and the other was nebulous. The opaque graft had been badly cut by the overlying stitches and there was an adhesion of the iris, through which the graft became vascularised. The graft in which the opacity was not dense had not been cut by the stitches, and the adhesion of the iris which was present had become resolved into more or less atrophic elongated bands.

In the light of these experiences, it seemed important to minimise the mutilation of the graft by the pressure of the stitches. It appeared that some swelling of the graft took place during the early days after the operation, and consequently there was a tendency for the graft to bulge if it were cut of equal size to the gap in the cornea. This caused increased pressure on the graft by the stitches, which rendered the stitches more liable to cut into it. For this

reason unequal trephines were used in the next group.

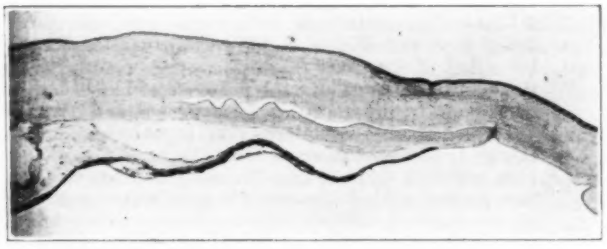
Group C consists of two rabbits, the graft in each case being removed with a trephine and scissors, but the trephine used for outlining the graft was half a millimetre less in diameter than that used for outlining the bed prepared for its reception. Both these grafts became united, but neither was clear. One was just nebulous when the rabbit died two and a half months after the operation, and the opacity seemed to be getting less. The iris was adherent. The other had a small central area which was nearly clear when it died three weeks after the operation; the iris was not adherent but the graft had been cut to some extent by the stitches.

Group D consists of 13 grafts, three of which have to be discounted owing to early death of the animal and accidental damage. Of the remaining ten grafts, seven were operated on by a particular technique, which proved to be the best type of operation in this group. In the case of the other three grafts, experimental departures from this technique were tried but did not prove successful, for two of them failed to unite and the remaining one was opaque.

The remaining seven grafts, operated on by the best technique, were all removed with the aid of trephines and scissors. The method employed was similar to that used in Group C, but with slightly smaller trephines than those used in Group C, and the difference in size between the trephines was slightly less. The smaller trephine was used for outlining the graft, and the larger one for outlining the piece of cornea removed. The graft in each case was held in place by the "cross-stitching" method already described. The margins of the graft and of the bed prepared for it were in each case made shelving.

Each one of the seven grafts became united; only one was opaque; one showed a small central clear area, and the remaining five were transparent

FIG. 10.



Type 6B at three months. Showing extensive adhesion of the iris with new tissue deep to Descemet's membrane. Mag. ×18.

or nearly so. The opaque graft had a well-marked adhesion of the iris to the graft, whereas four of the clear grafts had either no adhesion of the iris or the adhesion was very small and became freed in less than three weeks.

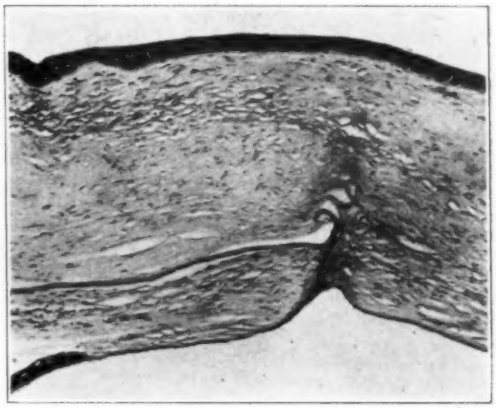
In the case of the fifth graft, described as being clear, the iris was adherent but not extensively so, and although this graft was sufficiently clear to enable one to see the iris through it quite easily, it was not entirely free from a slight haziness. Two of the five clear grafts were among those demonstrated at the Ophthalmological Society Meeting in April last year, and one of these is now preserved in the Museum of the Royal College of Surgeons of England (Figs. 3 to 7).

The results of the technique adopted for the seven rabbits referred to are by far the best that I have obtained by any method.

SUMMARY.

After allowing for those experiments which have to be discounted for reasons that have been given, a comparison between the percentage of grafts that became united in the six main types of operation that have been described shows that of the 17 central grafts secured by stitches joining together the cut edges, 56 per cent. became united, while of the seven central grafts with shelving edges, where no stitches at all were used, 57 per cent. united, which is at least as good a result as that obtained where stitches were inserted into the graft. Of the 18 marginal grafts, 72 per cent. became united, and of the 22 grafts where "cross-stitching" was used to secure the graft in place, 77 per cent. became united. The best results, however, were obtained in the case of the seven rabbits operated on included in Group D of the "cross-stitching" operation, where all the grafts became united and five were clear, only one being definitely opaque.

FIG. 11.



Enlarged view of Fig. 10 at the end of the graft's Descemet's membrane. Mag. ×83.

Requirements for Grafting.

In my experiments carried out on rabbits, using homoplastic grafts, the question of blood grouping, of course, does not arise. I have, however, succeeded in transplanting a corneal graft taken from the eye of a cat on to a rabbit's cornea, but the graft was not transparent. It had a fairly marked adhesion of the iris, which of itself would account for opacity, and was vascularised by blood-vessels coming from the adherent iris and a few from the conjunctiva. The graft became well united and flat, but was quite opaque when the animal died one month after the operation. I also transplanted a portion of human cornea on to a rabbit's eye. In this case the graft united well, although one margin was at first a trifle raised above the general corneal surface. The iris was free, but a few blood-vessels reached the graft from the conjunctiva and caused the graft to become pink in colour. When the animal died three months after the operation the graft was opaque. The

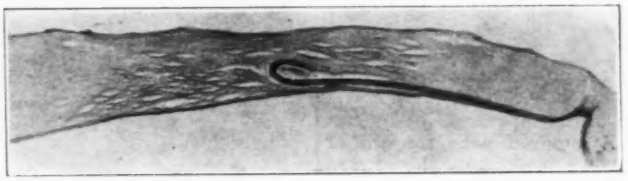
failure of these two grafts is in accord with the accepted view in regard to heteroplastic grafts.

Insertion of stitches into the cornea is not universally regarded with favour, but it is my experience that stitches inserted according to the operation I have described are tolerated by the cornea fairly well.

In transplantation of the cornea, as in transplantation of other tissues, one desirable result is that the graft should unite, but if a corneal graft is to give any useful visual result its transparency must also be retained. One has to remember that the nutrition of the graft is derived simply from the margins, and as the cornea is barely 1 mm. in thickness, and less than that in the case of the rabbit's eye, the surface area from which nourishment can be obtained is very small. This surface area is considerably increased when the margins of the graft are prepared in a shelving manner, and it seems that in this way the vitality of the graft is better preserved.

In order that the graft should become properly united, the marginal surfaces should be in accurate apposition with each other and retained securely in that position for at least eight days, and in order to effect this, it is far better to utilise "cross-stitching" than to insert stitches into the graft itself.

FIG. 12.



Fifth type at 16 months to show a new Descemet's membrane bridging over the gap, and passing behind the curled up cut ends of Descemet's membrane of both the graft and the cornea to fuse with their posterior surfaces. Mag. ×55.

In the case of other grafts, such as skin grafts, a certain amount of pressure is necessary in order to obtain union as speedily and surely as possible, and the graft must be retained securely in place and not subjected to the ill-effects of movement during the period when union is being established. These two conditions are satisfied by the "cross-stitching" method of securing the graft in place. The stitches are tied so as to exert a fairly firm pressure on the graft, which thus becomes, as it were, wedged into place. During the next week or so, two influences are at work which to some extent compensate each other; the swelling which takes place in the graft is to some extent balanced by a certain amount of loosening of the stitches due to the pull exerted on the intra-corneal portion of each stitch. The graft fits snugly into its bed. It cannot move backwards because it is supported at the margins by the sloping bed on which it rests, and because the intra-ocular pressure supports it.

The maintenance of the intra-ocular tension depends upon the establishment of a water-tight union between the graft and the cornea, which is best effected by the method described. This also enables the anterior chamber to be re-established, and lessens the likelihood of an adhesion taking place between the iris and the graft. The graft cannot move sideways or forwards because of the pressure exerted upon it by the stitches which cross its anterior surface, so that in the normal course of events, the graft is assured of the freedom from movement which is so necessary.

When the margins of the graft are kept accurately in position in this way, septic complications—which are detrimental to success—are much less likely to occur. If a portion of the graft becomes detached, there is a great liability for the detachment to increase, and leucocytic infiltration occurs in the substance of the graft. It is also liable to be invaded by leucocytes and epithelioid cells, which penetrate the surface of the graft or find their way from the conjunctival sac into the detached margin (Fig. 8). The graft and the bed in the cornea prepared for it must be accurately marked out and this is best done with the trephine. A round graft prepared in this way has no corners that might protrude and so lead to its detachment. The margins of the graft and the margins of the corneal bed prepared for it should correspond closely to each other in regard to the relative positions of the cut ends of Descemet's membrane and the corneal tissues, as seen in section at right angles to the cut surface.

In one of my cases, where the graft came away completely, the technique was faulty, and this correct adaptation did not obtain. The result was that an epithelial layer formed deep to the graft, which prevented the graft from uniting. It is quite possible that in this case a portion of Descemet's membrane was in apposition with the cut corneal surface, which prevented the nutritional channels being established (Fig. 9).

The use of olive oil seems to be an advantage, as it does not interfere with the union that has to take place, and at the same time acts as a lubricant on the delicate tissues that have to be handled, minimising the chances of unnecessary damage.

Adhesion of the iris to the graft does not necessarily lessen the chances of the graft taking, although, as I have noted in a few cases, there is a tendency to secondary glaucoma. It does, however, materially lessen the chances of obtaining a clear graft, and for this reason a small graft in the centre of the cornea is chosen in preference to a larger one, the pupil being kept well dilated to keep the iris free. Vascularisation of the graft takes place very readily when the iris is adherent, and the presence of blood-vessels in the graft invariably results in some degree of opacity. If the vascularisation is extensive, then the graft becomes more or less opaque.

In addition to this, an adherent iris tends to form new tissue behind Descemet's membrane and this tissue results in deeply seated opacity, which has a very detrimental effect on any visual result that may be obtained even though the graft itself were comparatively clear. In some of the cases, the formation of a new Descemet's membrane has been noticed behind such tissue (Figs. 10 to 12).

In order to avoid indenting and, in some cases, cutting the graft by the overlying stitches in the "cross-stitching" operation, experiments are now being carried out in which a glass disc is inserted between the stitches and the graft. This appears to be a useful modification, but at the moment it is too early for me to quote results.

Conclusion.

As a general conclusion from my experimental work, it appears that transplantation of the cornea in rabbits can be successfully carried out, although certain essential conditions must be observed if the results are to be good. It is recognised, of course,

that the experiments which I have described were carried out on normal rabbits, but if corneal transplantation is to be applied to man in order to remedy blindness, which has been regarded in the past as practically incurable, it is reasonable to assume that methods which have proved inefficient on normal eyes would not be successful when operating on a cornea damaged as a result of previous disease or injury. I would point out, however, that the cornea of a rabbit is thinner than the cornea of man, so that apposition of the margins of the graft has to be all the more accurate.

Furthermore, it is more difficult to ensure asepsis in the case of a rabbit during the period of healing, as the animal is not under the same control as a patient lying in bed. In this way, slight defects in the healing of the graft are apt to lead to more serious consequences: if, for example, the edge of the graft at one spot overlaps the adjacent cornea, it affords an excellent opportunity for the entrance of bacteria, and septic complications—which are so damaging in their effects—are likely to result.

Of the methods of corneal grafting which I have described, one appears to offer very much better chances of success than do the others, so that of the seven rabbits operated on by this method, all of the grafts united, five were transparent, one had a central clear area, and only one was opaque.

THE COMPARATIVE FREQUENCY OF GLIOMATOUS AND NON-GLIOMATOUS TUMOURS WITHIN THE SKULL.

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The object of this communication is to re-examine the incidence of tumours of the glioma group as compared with other types of neoplasm within the skull. It will be recalled that Howard Tooth,[1] in his pioneer investigations at the National Hospital, Queen-square, in 1912, found that out of 258 intracranial tumours verified during life or after death by histological methods, 127, or 49·2 per cent., were gliomata, or, omitting, as it is proposed to do throughout this paper, all metastatic tumours and purely intrasellar ones (pituitary adenomata), 54·3 per cent. A much larger series of histologically verified tumours has more recently been published by Cushing and his collaborators[2]—viz., 1522 histologically verified tumours, of which 634, or 41·7 per cent., were gliomata, but if we subtract metastases and the very large number of pituitary adenomata in this series, the percentage of gliomata is raised to 54·2, a figure practically identical with Tooth's.

Since it is impossible to take objection to the methods by which these figures were arrived at, it is only natural to conclude that not more than just over half of all intracranial tumours (omitting metastases and pituitary adenomata) are gliomatous. It is, however, open to question whether these figures accurately represent the whole situation. In the first place, they seem to conflict with clinical experience, for it can hardly be denied that we should approach cases of intracranial tumour with far greater optimism if we believed that the chances of the tumour being a glioma were only very slightly greater than its being something else. Secondly, whereas the only exact method of determining the *nature* of a tumour is obviously the histological one, certain extraneous factors may tend to render this method less exact for determining the *frequency* of the various kinds of tumour in a given organ or organs. Such extraneous factors seem to operate in the case under consideration, since there are good grounds for believing that of intracranial neoplasms the glioma is the most, and the non-gliomatous tumour the least, liable to escape the attention of the histologist. During life, that is to say at operation, the glioma tends to escape because, being a tumour of the essential brain substance, it is not necessarily situated on or even near the surface. After death it is again apt to escape owing to the fact that so many of its victims die at home. Every neurologist is aware of the kind of thing that happens, at any rate in this country. A patient is admitted to hospital with the symptoms and signs of cerebral tumour; a craniotomy is performed, and as not infrequently happens, no tumour is visible, or if one is seen or felt in the substance of the brain it is deemed inadvisable to explore further. The patient, relieved of his pressure symptoms, is discharged from hospital, and after a longer or shorter period his tumour is buried with him. Moreover, the undoubted improvements in surgical and anæsthetic technique together with the more judicious selection of cases have tended materially to lower the *immediate* post-operative fatalities, and so to lessen the opportunities for post-mortem verification in hospital practice. Thirdly, one must not lose sight of the other side of the picture—namely, that given a reasonably accurate localisation, the surgeon will at least find, even if he cannot wholly remove, a very large proportion of non-gliomatous tumours, because they are nearly all surface tumours and not true *cerebral* tumours at all.

This argument would, of course, cease to be valid if it were the fact that the non-gliomatous tumour was more difficult to localise than the glioma; but the very reverse is the case. For reasons which are not completely understood, remote effects—that is to say disturbances of cerebral function not directly referable to that part of the brain occupied by the tumour—are definitely more common in gliomatous cases. The varying rates of growth of the tumour are partly responsible for this condition of affairs; the slower the rate, the greater is the capacity of the skull contents to adjust themselves to the growing tumour, with the result that although evidences of disturbed function may be slow to develop, when they do appear they are of great localising value. In the case of rapidly growing tumours, on the other hand, like many of the gliomata, signs of increased pressure may arise so rapidly that they may altogether mask the local lesion by giving rise to false localising signs of a most baffling character.

A Series Analysed.

With these considerations in mind, I have analysed all cases of intracranial tumour (excluding metastatic and purely intrasellar neoplasms) of which I have notes. Out of a total of 190 cases, 125 were "verified." Among the "verified" tumours are included four vascular tumours fully exposed at operation, concerning the nature of which no possible doubt could be entertained, and one bony tumour of the basis cranii which was demonstrated radiologically and exposed, but not removed, at operation. All the rest (120) were verified histologically.

[1] Tooth, H.: Brain, 1912–13, xxxv., 61.
[2] Cushing, H., and Bailey, P.: Tumours Arising from the Blood-vessels of the Brain, London, 1928, p. 4.

Of the 125 *verified cases* 80 (64·0 per cent.) were gliomata, and 45 (36·0 per cent.) non-gliomatous. Before discussing the 65 unverified cases it will be useful to consider the methods by which verification was obtained in the gliomatous and non-gliomatous groups respectively.

In the 80 cases of verified gliomata craniotomy was performed in 33 patients with the following results:—

Gliomatous Group (80 Cases).

Total craniotomies.	Seen and verified.	Seen, not verified.	Not seen.
33	17 (51·0 %).	8 (24·5 %).	8 (24·5 %).

In the 45 cases of verified non-gliomatous tumours cranitomy was performed on 39 patients with the following results:—

Non-gliomatous Group (45 Cases).

Total craniotomies.	Seen and verified.	Seen, not verified.	Not seen.
39	34 (87·2 %).	1 (2·6 %).	4 (10·2 %).

In this series of craniotomies, therefore, the chances of verifying a glioma were approximately as 1 is to 1, compared with 6½ to 1 in favour in the non-gliomatous group. Moreover, of the five non-gliomatous tumours not verified at operation, one was an olfactory endothelioma which owing to its large size was regarded as inoperable, while two were auditory nerve tumours, in which the operation had to be terminated owing to the collapsed state of the patients.

These figures indicate that whereas relatively few non-gliomatous tumours escape verification during life, the reverse is the case with the gliomata. Further, improved technique in diagnosis, particularly the assistance afforded by X rays in the case of the endothelioma, is tending to improve the craniotomy rate of verification in non-gliomatous cases. Thus in this series, out of a total of 45 verified non-gliomatous tumours, verification was obtained by craniotomy in 34 cases, or 75·5 per cent., whereas in 80 verified gliomas craniotomy as a means of verification was successful in only 17 cases, or 21·2 per cent. In other words, three-quarters of non-gliomatous neoplasms were verified during life, as compared with one-fifth of gliomatous tumours; in the latter group we are therefore far more dependent on post-mortem examination for verification, as the following Table shows:—

—	Total cases.	Verified at operation.	Verified post mortem.	Operation without verification	Verified post mortem; no operations.
Gliomatous	80	17 (21·2 %)	63 (78·7 %)	16 (20·0 %)	47 (57·5 %)
Non-gliomatous	45	34 (75·5 %)	11 (24·4 %)	5 (11·1 %)	6 (13·3 %)

The large proportion of gliomata verified post mortem as opposed to antemortem calls for some explanation, for there is reason for supposing that under other circumstances the proportion would be smaller. It might, in fact, be argued that far too large a proportion of these patients were denied their only chance of survival—namely, surgical interference. The reasons are as follows: (1) A large majority of these patients were admitted to St. Thomas's Hospital; now at a general hospital quite a number (11 in this series) of cases are admitted as medical emergencies, comatose or semi-comatose, the result of a hæmorrhage into the tumour, or as happened in two cases, from the surface of the tumour. These cases are usually regarded as primarily vascular in origin until autopsy discloses the true state of affairs. In every case the tumour was a glioma. (2) The rather large percentage of gliomata seen but not verified at operation is due partly to the judgment and practice of the particular surgeon, and partly to the fact that the series includes several cases occurring at a period when exploration of the brain substance was less freely practised than it is to-day. (3) The relative infrequency of craniotomy—i.e., 33 craniotomies out of 80 verified glioma cases (41·2 per cent.), and in the whole series, 107 out of 190 (56·3 per cent.)—is attributable partly to (1), but to a much greater extent to my growing belief that many cases are best left alone; this applies especially to invasive tumours involving the white matter of the hemispheres in persons who are advancing in years. It may be urged that the withholding of surgical intervention must inevitably lead to the overlooking of many removable tumours. This is a risk which I am more and more prepared to take, but that the risk is a small one is indicated by the fact that in the present series no surface tumour was found unexpectedly except in two cases; in one (occipital endothelioma) the patient was admitted in semi-coma and remained uncoöperative until death three weeks later, while in the other a gross error of localisation on my part led to a faulty surgical approach. It should also be mentioned that of the six non-gliomatous cases in which no operation was performed a correct clinical diagnosis had been arrived at in four, and in only one (bilateral auditory nerve tumour) could there have been any possibility of successful surgical intervention.

Passing on to the consideration of the 65 *unverified cases*, three were clinically suprapituitary cysts, two were lateral recess tumours in which operation was refused, while in three (two craniotomies) no opinion could be expressed as to the nature of the tumour. Of the remaining 57 cases craniotomy was performed in 36; in 24 of these a tumour with the naked-eye appearances of a glioma was seen reaching the surface of the brain, but not verified, while in 12 cases exploration was wholly negative. Of these 12 cases, all of them tumours of the hemispheres or corpus callosum, five have been lost sight of and seven are dead, the longest survival period being three and a half years.

In the remaining 21 cases no operation was performed; of these two were pontine tumours in children (both dead), four were midline cerebellar tumours in children (all dead), while 15 were tumours of the cerebral hemispheres in adults, of whom nine are dead and six cannot be traced.

With respect to these 21 cases (no operation) and the 12 cases in which craniotomy gave a negative result, the clinical evidence was in my opinion sufficiently strong to justify their being regarded as gliomatous. Without going into details as to the differential diagnosis of intracranial tumours, the evidence in favour of a given tumour being a glioma is based on the following considerations: the situation of the tumour; the age of the patient; a relatively short survival period, where known; negative X ray findings; evidence of progressive infiltration of the brain substance as shown by the spread and increase of paralytic phenomena; and sudden increases of paralytic phenomena owing to hæmorrhage into the tumour.

If we include among the gliomata the 24 cases in which a glioma-like tumour was seen but not verified, and the 33 cases in which the tumour was assumed to be a glioma on clinical grounds alone, we have a total of 137 gliomata out of 190 cases, or 72·1 per cent. It is manifestly very easy to criticise the methods by which this figure has been arrived at; nevertheless I believe it to be a truer representation of the facts than the lower figures obtained by the microscope alone.

Conclusions.

(1) It is suggested that the figures arrived at by the only exact method—viz., histological examination—materially underestimate the relative frequency of the glioma group. This figure is of great importance clinically because on it very largely depends the general prognosis in cases of intracranial tumour. (2) In a series of 190 cases of intracranial tumour evidence is brought forward to show that the chances of "verifying" a glioma at operation are considerably less than those of verifying a non-gliomatous growth. (3) Whereas verification was dependent on post-mortem examination (with or without previous surgical intervention) in 78·7 per cent. of 80 gliomatous tumours, craniotomy was successful in verifying 75·5 per cent. of 45 non-gliomatous tumours. (4) Of patients dying of intracranial tumour *unverified during life* in a very large majority the tumour is a glioma. Many cases escape post-mortem examination, and accordingly many gliomata remain unverified. (5) It is suggested that, excluding metastases and pituitary adenomata, the glioma is not merely as common as, but is actually two to three times commoner than, all other intracranial neoplasms put together.

SYMPTOMLESS ACUTE MASTOIDITIS:

A RECORD OF FOUR CASES.

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NOT all cases of acute suppurative mastoiditis are associated with symptoms. It is possible for such a dangerous condition to be present, even with an intracranial extension such as a perisinus abscess, and yet for the lesion to be entirely latent as regards symptomatology, though recognisable by the otologist familiar with the protean manifestations of acute mastoiditis. The record below illustrates typical cases of acute mastoiditis with no symptoms.

It is a recognised clinical observation that one of the most reliable signs of acute mastoiditis, if present, is a sagging or bulging of the posterior superior wall of the osseous meatus where it abuts on the tympanic membrane. This sagging may be slight or so marked as to obscure a view of the drum. What is not so widely accepted is the important fact that this bulging or sagging may be the only sign or symptom indicating the presence of a suppurative mastoiditis, or even an intracranial collection of pus. If this sign is overlooked the condition remains latent until some further complication occurs, such as meningitis or lateral sinus thrombosis, at which stage the patient's life is definitely endangered. Its recognition enables the operator to come to grips with the infection in its early stage. Its detection depends on routine otoscopic examination in all acute ear conditions, after the meatus has been thoroughly cleansed of all discharge by syringing and mopping. Every acute ear condition should be submitted to repeated otoscopic examination, and for this purpose I would draw attention to the clear views of the tympanic membrane and the deep reaches of the meatus obtained with the electric otoscope. No one who has to deal with ear conditions should fail to avail himself of the use of this instrument. It must be used to be appreciated.[1] The possession of an electric otoscope will overcome any reluctance on the part of the practitioner to inspect the tympanic membrane in all acute ear conditions, and in fact will enable him to do so under all circumstances, rendering him independent of external lighting conditions. It is the only instrument that makes it possible adequately to examine the ear of an infant or refractory child.

The usual history of this type of case is as follows. The patient, who may be a child or an adult, has had an attack of acute otitis media, with or without an actual ear discharge. The acute ear condition has apparently subsided, except for occasional attacks of pain, a factor that leads to further advice being sought. It will be recollected that the pain of an acute otitis media should subside soon, and that any pain persisting after the first few days should call for a searching examination as to the cause as, if there is free drainage, it is strongly suggestive of an extension of the suppuration outside the confines of the antrum and tympanic cavity. The case, as a rule, reaches the otologist about the third week after the first onset of the attack. In the interval there has been little pain, no temperature, no mastoid swelling or œdema, and no tenderness over the mastoid. (If the case is neglected and is seen late, some œdema may be present behind the ear; the œdema is free from tenderness and is situated in the premastoid space.[2]) There is no impairment of hearing, and there may be little or no otorrhœa. Sometimes the discharge may be profuse, as in Case 3. Only on otoscopic examination is any abnormal sign found—viz., a bulging or sagging of the posterior or superior wall of the osseous meatus, in juxtaposition with the membrane. The tumefaction may be slight, or so marked as to prevent any view of the tympanic membrane. Even if the case is kept under observation for a time, the picture will remain unchanged as regards symptoms or signs, as Case 2 shows. But whenever such a case is encountered it should be operated upon forthwith, by the mastoid approach. No surgeon will regret the step, and he will be surprised at the extent of the suppuration revealed at operation, in view of the absence of signs and symptoms.

The cases of meningitis and sinus thrombosis developing some short period after an attack of acute otitis media are, in many instances, due to neglect of this physical sign which is not seen unless sought; observers only see what they are searching for. The case thus presents its symptoms only when the meningitis is in full swing, when treatment is too late to be of any avail.

Acute otitis media due to the *Streptococcus mucosus* has a sinister reputation for being followed by intracranial complications, the whole sequence being

[1] In choosing an electric otoscope, the following criteria must be satisfied. It must be light in weight; must work with an ordinary pocket torch battery; the specula must not be cumbersome, but light; the lens must be focused at least 1 cm. beyond the point of the speculum; a bulb for coverting it into a Siegle speculum must be available; a small speculum for use in examining infants must be available. The otoscope supplied by the Medical Supply Association fulfils these criteria. Many of the electric otoscopes supplied by other manufacturers fail in many of the essential points, especially in having the lens focused incorrectly.

[2] Asherson, N.: The Premastoid Space: its Relation to Mastoiditis, Journal of Laryngology, February, 1931.

latent until the grave complication becomes manifest. I have no doubt that, were the case observed in the latent stage, the bulging or sagging of the posterior or superior wall of the osseous meatus would be detected, and point to the mischief smouldering in the mastoid surroundings.

Clinical Records.

CASE 1.—A male, aged 30, complained of three weeks' pain in the ear. It was intermittent, with a little discharge. When seen he was free from pain and there was no discharge and little impairment of hearing. It was only the history of intermittent slight earache that drew attention to the ear. He walked up for examination, appeared well, and was free from pain and otorrhœa; he had no temperature and no mastoid tenderness. In fact he wished to go home for tea, and could not be made to realise that an urgent operation was necessary. There was no swelling or œdema behind the ear or over the mastoid. The only physical sign detected was a sagging of the posterior wall of the osseous meatus, which obscured a view of the tympanic membrane.

This type of infection of the mastoid is associated with a purulent invasion of the process and often with a perisinus abscess (see below and next case). To wait for any other sign, such as temperature, pain, or swelling behind the ear, is to court disaster, as it may coincide with the onset of a meningitis. In this case operation was performed without delay. As soon as the mastoid cortex was penetrated by the chisel, pure pus welled out. The whole mastoid process was a sac of pus, and a perisinus abscess was present. The wound was drained and healed up in six weeks, and hearing was perfect. Eighteen months later he could still hear perfectly; he was free from pain, and the drum was intact.

CASE 2.—A child, aged 5, was referred to hospital as a case of acute otitis media. The duration of the illness was a few weeks. There had been some earache and little discharge. When seen there was no pyrexia, no pain, no mastoid tenderness, and no œdema or swelling over the mastoid process. The case was ambulant, and certainly did not appear ill in any way. It had only been referred for opinion as an "ear case."

On otoscopic examination the tympanic membrane could not be observed, as a bulging of the posterior superior wall of the osseous meatus obscured it. The tumefaction was red and covered by intact, though inflamed, epithelium. It had the appearance of a furuncle, and occupied almost the entire lumen of this part of the meatus. There was no pus present.

The patient was admitted to the ward with the diagnosis of "mastoiditis, acute, for operation." Thereafter I did not see the case for a week. The house surgeon had incised the swelling but only blood had escaped. For the succeeding seven days, though under observation in the wards, there was no pain and no pyrexia, except for a temperature of 99° at the end of the sixth day. No tenderness over the mastoid became evident during the period of observation. I saw the patient again on the seventh day; the sagging of the posterior superior meatal wall was more marked and there was some slight œdema, without tenderness, deep to the auricular sulcus.

At operation (a week after the first inspection) by the resident the mastoid cortex was very thick, pus was present in the mastoid cells, and there was a collection of frank pus around the sinus, which was covered with granulations.

The child was discharged from hospital with the mastoid wound healed, but some three months afterwards was readmitted with a temporo-sphenoidal lobe abscess which proved fatal.

The only physical sign or symptom that led to an immediate diagnosis was sagging of the posterior superior osseous meatal wall. The other point of interest about this particular case was that, though the house surgeon kept it under close observation in the ward for a week, no symptoms were elicited and the temperature remained normal until the sixth day, when it rose to 99°, yet the operation, which should have taken place after the first examination, revealed extensive suppuration.

CASE 3.—Male, aged 30, gave a history of pain in the ear and a temperature. He looked pale and ill. There was no mastoid tenderness and no swelling or œdema over the mastoid or behind the ear. The drum could not be seen on account of sagging of the posterior-superior osseous meatal wall. Pus could be seen deep to the tumefaction, and as fast as it was mopped out it tended to reaccumulate. With a Siegle's speculum pus could be aspirated from the part of the meatus deep to the swelling. The condition was due to a mastoiditis. The sagging of the posterior meatal wall made the condition an urgent one, and immediate operation imperative. The patient was referred elsewhere as no bed was available, but I have no doubt that the mastoid was full of pus, and that the pus may have extended to the dura.

This case typifies another important physical sign for opening the mastoid process, to wit, the rapid refilling of the meatus with pus after it has been thoroughly cleansed. The following case is one in which this sign enabled an extradural abscess to be opened during its "symptomless" stage.

CASE 4.—A male, aged 24, had chronic otorrhœa (left) for three months. The discharge was profuse and there was a fullness on that side of the head. There was no headache or rise of temperature. He was referred for opinion on account of morning vomiting of recent onset. He was consequently admitted for observation for a period of 14 days. During this interval, though the discharge continued, no other symptoms or signs developed. There were no changes in the fundus oculi, while an examination of the central nervous system proved negative. No pyrexia was observed at any time and the temperature was not subnormal. No vomiting occurred during this time and he appeared very well. But it was observed that, although the meatus had been thoroughly cleaned out, in a few hours it was again overflowing with pus, suggesting that some reservoir deep down was feeding the meatus. A skiagram revealed a densely sclerotic mastoid process, devoid of any evidence of mastoid cells. Otoscopic examination showed a central perforation of the tympanic membrane, but there was no sagging of the posterior superior osseous meatal wall.

At operation the mastoid process was densely sclerotic, the lateral sinus far back (as a rule it is well forward in the sclerotic type of process); it was not exposed until late in the operation, and then only after searching. The antrum was small, containing little pus. On removing the roof of the antrum a gush of pus revealed an intracranial abscess cavity about the size of a walnut in the middle fossa. It was extradural, and probably intracerebral as well. The surrounding granulations were adequately exposed by removing the dense bone from the roof and posterior part of the mastoid process. The simple mastoid operation was completed and the cavity drained. Convalescence was uneventful. In spite of the prolonged hammering of the dense bone there was no residual headache or nystagmus after the operation. He was well three months later.

This case exemplifies the rule that in all cases of chronic suppurative otitis media if, after thorough cleansing of the meatus, the discharge rapidly accumulates, it is an indication that deep to the middle ear is a reservoir of pus, which is discharging through a narrow vent or passage. The eliciting of this sequence is an indication for opening the mastoid. If, in addition, as in this case, the radiogram reveals a sclerotic process—i.e., one devoid of cells—it is obvious that the collection of pus must be either perisinus, extradural, or cerebral. It could not arise from non-existent cells in the mastoid, and if it arose merely from the antrum the meatus would not refill so rapidly.

The other point to be stressed in this case—and it is of such significance as to be always remembered—is that, if a patient with a running ear has any symptom suggestive of dural involvement (the vomiting in this case), this history must be regarded seriously, in spite of the absence of the symptom when the case is actually observed.

Summary.

(1) The cases suggest that sagging of the meatal wall may be the only sign or symptom of a suppurative condition in the mastoid process or its extensions (dura or sinus). It could be termed "anterior" mastoid periostitis. (2) Its presence indicates that it is imperative to open the mastoid forthwith. In both the cases operated on, not only was the mastoid extensively infected, but a perisinus abscess was present as well. It would be easy to overlook the gravity of the sign until a rigor heralded the onset

of an infected sinus, or the symptoms of a meningitis supervened. (3) Routine otoscopic examination is important in all ear conditions. No case of acute otitis media can be discharged from observation without an otoscopic examination. (4) Suppuration in the mastoid and intracranial extensions may be present without symptoms. (5) Rapid accumulation of pus in the meatus is a significant sign for operation. (6) In a case of otorrhœa any history suggestive of an intracranial extension of the suppuration must be taken seriously, notwithstanding its absence when under observation.

SURGICAL CATGUT.

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The greatest advantage derived from the use of catgut as a suture material is its disappearance from the body when its function of the coaptation of cut surfaces has been taken over by the formation of living fibrous tissue. This by itself does not make it preferable to silk or thread, but if this property of dissolution be combined with certain sterility, good tensile strength, and an absence of irritating effects upon the tissues in which it is embedded, then it becomes the material of choice for the ligature of vessels and the suture of severed tissues. The catgut prepared according to the method described here possesses these qualities in a very high degree. It has been used by Prof. C. A. Pannett for nine years, giving every satisfaction, and for a shorter time by other surgeons at St. Mary's Hospital.

Method of Sterilisation.

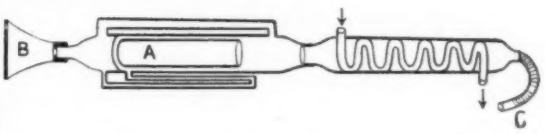
Dry, twisted commercial catgut was used. There is no advantage from the point of view of sterility of the final product in attempts to carry out the manufacturing process under sterile conditions, nor in sterilising the ribbons before they are twisted. The experiments detailed here show that heavily spore-infected catgut is certainly rendered free from organisms by the method described. The researches of L. H. Lampitt and J. H. Bushill have laid down the conditions which must prevail during the manufacture of catgut in order to preserve its maximum strength. These requirements of correct hydrogen-ion concentration, width of ribbon, and number of turns per inch appear to be fulfilled by certain of the makers of commercial catgut. The sterilising agent used is peppermint oil. Its use was first suggested by Captain S. R. Douglas, F.R.S., of the Medical Research Council. His method has been altered in detail, but not in principle, so that the required degree of resistance to absorption has been obtained. This vegetable oil is distilled from the herb *Mentha piperita*, and has the following characteristics: Specific gravity, 0·9; refractive index, 1·46; menthol content, 60 per cent.; optical rotation, −20° to −35°; solubility, 1 in 4 in 70 per cent. alcohol.

Two small experiments were carried out with the oil alone. It was tested in various dilutions of from 1 : 10 to 1 : 1000 against a culture of pure staphylococci, the result showing that the oil was bactericidal up to a dilution of 1 in 200. Its power of diffusion, tested on an agar plate against various other well-known and commonly used antiseptics, showed it to be in this respect the equivalent of mercury perchloride.

The exact technique of the preparation by this method is as follows:—

1. The raw gut is soaked for six hours in a bichromate solution of sodium bichromate, grs. 45; phenol, drachms 5; glycerin, drachms, 5; aqua distillata, ad oz. 30.
2. The gut is taken out and hung and dried overnight. It is then cut and hanked.
3. The hanks are placed in a hermetically closed container filled with peppermint oil in spirit (1 in 10), which is immersed for two hours in a water-bath kept at a temperature of 60° C.
4. It is left for 24 hours and again heated for a further two hours at 60° C., the container being untouched throughout.
5. The gut is removed and preserved in 1 : 20 carbolic in spirit.

The efficacy of the process was tested as follows. Eighteen hanks of raw catgut (each 12 to 15 in. long) were taken and treated in the following manner: six were placed in broth cultures of *B. subtilis*, six in similar (anaerobic) cultures of *B. sporogenes*, and six in similar (anaerobic) cultures containing avirulent *B. tetanus*, *B. sporogenes*, and a few *B. welchii*. The *B. subtilis* cultures were incubated for 48 hours (until a plentiful growth was evident) and the remaining two series for two weeks. At the end of these periods the gut was sterilised, strictly according to the above method, after which it was subjected to a process of distillation with ether (to remove the peppermint oil) and water (to remove the chromic acid). The process was carried out under entirely aseptic conditions by the use of a sterilised Soxhlet apparatus arranged as in the Figure.



The gut was removed from the container by sterile forceps and placed in the previously sterilised paper envelope "A" in the Soxhlet. Ether was placed in flask "B" and boiled until some six to eight distillations had taken place. The glass tube "C" (until this stage plugged with sterile wool) was then attached to a rubber tube leading from a flask of boiling water and six distillations with water were carried out.

At the conclusion of this process the gut was removed (again with sterile forceps) and each hank of each series replaced in new broth tubes (rendered anaerobic of course where necessary). The result of incubating these cultures at 35° C. was as follows:—

1. *B. subtilis* cultures (48 hours), one hank dropped on bench during transference and therefore discarded; five remaining tubes, no growth.
2. *B. sporogenes* cultures (2 weeks), six tubes, no growth.
3. Mixed cultures (2 weeks), with *B. tetani*, *B. sporogenes*, and *B. welchii*, six tubes, no growth.

To prove that the success of the process of sterilisation was in no way due to the distillation method (i.e., that the ether had itself no disinfectant effect) another series of six hanks of gut were similarly treated except that they were not sterilised by peppermint oil—i.e., they were infected (with a mixed culture of anaerobes), distilled and recultured. The result was a heavy growth in all six tubes, which on microscopic examination showed all the bacteriological strains of the original culture.

As a further proof of the efficacy of the oil as a sterilising agent, two of the *B. sporogenes* and two of the mixed (*B. tetani*) culture tubes which had shown no growth after three weeks' incubation were treated as follows. The broth was removed by sterile pipette and replaced by 5 per cent. acetic acid, in an

attempt to disintegrate the catgut and prove by further culturing that no spores had been retained in its meshes. As after a fortnight the acetic acid appeared to have had little effect, this fluid was withdrawn and a peptone-hydrochloric acid solution (equivalent to that of gastric juice) was substituted. In a further fortnight the gut, though not completely dissolved, was softened practically to a state of disintegration. The fluid was centrifuged and a few drops from the bottom of the centrifuge tube reincubated for two weeks in an anaerobic broth culture; again in neither case (i.e., *B. sporogenes* or *B. tetani*) did growth result.

Reaction of the Tissues.

However strong a catgut might be, however dependable its sterility or its property of disappearing from the body, it would not be desirable if it set up an excessive irritation in the tissues in the process of dissolution. Adherents of silk have recommended the material of their choice not only because of the ease and certainty of its sterilisation, but also because they have maintained that it is inert in the tissues and sets up less reaction than catgut, which must be digested and removed by cell activity. Experiments have proved, at least in the case of catgut prepared by the peppermint oil method, that this is a delusion. Silk sets up far more reaction in the tissues, which attempt in vain to remove it, the failure of their efforts leaving behind a mass of fibrous tissue. Catgut sets up tissue activity which proceeds to its normal conclusion, and the amount of scar tissue remaining is a minimum.

The following experiments were carried out to demonstrate the effect of these two materials on the tissues.

Two rabbits were operated upon * on the same day, all aseptic precautions being scrupulously observed. The anæsthetic used was ether. The skin of the anterior abdominal wall, previously depilated and prepared, was incised in the median vertical plane and dissected back. On either side of the mid-line a vertical through-and-through stitch was inserted into the abdominal wall. It penetrated the peritoneal cavity and emerged on the surface of the muscle of the abdominal wall. Catgut was used on one side and silk of the same thickness on the other. The median laparotomy wound was then sewn up. The silk was sterilised by simple boiling.

After ten days one rabbit was killed and the area of the anterior abdominal wall containing the sutures was removed en bloc. This tissue was divided transversely into three pieces, each of which thus contained a silk suture at one end and a gut at the other. These pieces were fixed and sectioned, the sections being cut, two at right angles and one parallel with the surface. Each piece was cut in series, sections being 8 μ apart, and each section stained alternatively with hæmatoxylin and eosin, and van Gieson's stain.

On macroscopic inspection of complete piece of abdominal wall after removal: 1. No adhesions were found in the peritoneal surface to either line of sutures. 2. The peritoneum had already grown completely over all sutures which had penetrated it. 3. The reaction to the silk was obviously much greater. 4. Catgut sutures were visibly breaking up.

The result of microscopic examination of sections was as follows:—

Gut.—The strand was partly broken up and lying in a space in the tissues. Closely surrounding and invading the gut were many polymorphs (mainly showing trilobed nuclei). Outside the clear tissue space in which the suture was lying were many more mobilising leucocytes, and the van Gieson stain showed a definite though not marked fibrous reaction.

Silk.—The threads were still intact and leucocytes were evident in numbers adhering to these. The surrounding polymorph immigration was much denser than in the case of the gut, and the van Gieson stain showed a marked fibrous reaction with a diameter at least twice as big as that of the gut.

The second rabbit was killed on the twenty-first day after the operation and a similar procedure was carried out. Macroscopic inspection showed: 1. No peritoneal adhesions. 2. Catgut stitches not visible from peritoneal surface. 3. Silk stitches still visible and on palpation giving the feel of a hard fibrous nodule.

The result of microscopic examination was as follows:—

Gut.—Strands were still visible, but showing no continuity. The surrounding reaction, though slightly larger than in the "ten day case," was definitely much more cellular than fibrous.

Silk.—The threads were still intact and the surrounding tissue reaction, which contained several obvious giant cells, was more than twice as great as that of the gut, and extended through practically the whole thickness of the abdominal wall. In consistency it was decidedly fibrotic, few individual cellular elements being discernible.

The whole series of experiments was then repeated, the results confirming in detail those of the previous set.

From this it appears that, if the object of surgery is to reconstitute the tissues after operation in as nearly as possible their original natural condition, then catgut is a more suitable material than silk. After three weeks the catgut suture material had itself disappeared, whilst the consequent tissue reaction was relatively slight, showing indications of ultimately conforming even more completely to the original pre-operative cellular condition of the tissues. The silk suture, on the other hand, had in the same period shown no signs of disintegration and had produced a most definite and extensive "foreign-body" fibrous reaction in the surrounding tissues.

Tensile Strength of the Catgut.

No method of sterilising catgut can be recommended if it interferes seriously with the strength of the material. Experiments were therefore undertaken to determine what change, if any, took place as a result of the above method of preparation and to measure the deterioration in tensile resistance. The apparatus used in these determinations was that recommended by L. H. Lampitt and J. H. Bushill, made by Messrs. Goodbrand and Co., Ltd., of Stalybridge, and used in the testing of cotton yarns. Lengths of gut of 24 in. were stretched on this instrument and the breaking strain and elongation at this point were noted. The results are shown in Table I.; they are average figures for 15 to 20 experiments.

TABLE I.

		Raw.				*Prepared.*			
Size.	Approximate diameter in inches.	Original diameter in 800th of an inch.	Stretch (ins.).	Strain (lbs.).	Stretched diameter in 800th of an inch.	Original diameter in 800th of an inch.	Stretch (ins.).	Strain (lbs.).	Stretched diameter in 800th of an inch.
00	1/100	7	3½	2	7	8	4	3	8
0	3/200	12	5½	4½	10	12	6	4	11
1	1/50	14	4	7½	13	16	6	7¼	15
2	1/40	19	4	12	18	20	6	11¼	19
3	1/35	21	4	17	20	22	6	14	20

From this it will be seen that the prepared catgut: (1) has a slightly greater diameter than the same catgut in its raw state; (2) will stretch somewhat more; and (3) will bear slightly less strain. On an average the force required to break a piece of gut of the sizes tested diminishes the diameter by 1/800th

* By Prof. C. A. Pannett.

of an inch. The "strain" (tensile strength) which a particular piece of gut is capable of taking may be said approximately to vary directly as the diameter of the gut.

PRE-OPERATIVE TESTS.

If each length of catgut were stretched to breaking point before sterilisation, the remaining strands would obviously be more dependable in use and the operator would know what tension exactly his material could withstand. When, however, catgut is stretched the constituent ribbon is pulled into a tighter and closer spiral. The question therefore arises whether this increase in tightness of the twist interferes with the penetration of the antiseptic fluid. Experiments were carried out to test this. Lengths of catgut (24 ins.) were taken and infected with (1) *B. subtilis* and (2) *B. sporogenes*. They were then subjected to about one-half the average breaking strain, sterilised in the usual way, and tested for sterility as above described. In both cases the whole series of six tubes was devoid of any sign of growth.

The gut was then restretched to breaking point and a futher series of measurements taken as shown in Table II.

The results show that the method of sterilisation used is sufficiently potent to allow the oil to penetrate into the individual strands of the gut, even after stretching; and further that the tensile strength of the various diameters of gut is to all intents and purposes unaffected by the sterilisation process.

GENERAL CONCLUSIONS.

1. A method of sterilisation of catgut has been described which passes the most stringent bacteriological tests for its efficacy in killing off aerobic and anaerobic bacteria and their spores.

2. The tensile strength of the catgut is scarcely diminished by the process.

3. The catgut can be subjected to a preliminary tension without interfering with its sterilisation, thus ensuring a ligature of known breaking strain.

4. Catgut sterilised in this way is absorbed by the tissues of a rabbit with much less tissue reaction and formation of fibrous tissue than is produced by silk of the same diameter sterilised solely by boiling.

TABLE II.

B. subtilis *Infection* (*Lengths of 24 ins. of Chromicised Gut*).

Diameter (ins.).	Stretch applied (ins.)	Strain applied (lbs.).	Original diameter in 800th of an inch.	Infect and Stretched Diameter in 800th of an inch.	Diameter after culture in 800th of an inch.	Restretch in ins.	Restrain in lbs.	Final diameter in 800th of an inch.	Total Stretch (ins.).	Total strain (lbs.).
1, 2	0	2½	1½	12	11	11	4½	2½	10	7	35 6
3, 4	1	2½	3½	16	15	16	3½	3½	15	6	65 6
5, 6	2	3½	4	20	19	19	4	7	18	7½	11

B. sporogenes *Infection*.

1, 2	0	2½	1½	12	11	11	3	27 8	10	5½	43 8
3, 4	1	3½	3	16	15	16	2⅞	3⅞	14	6¼	6⅛
5, 6	2	2½	5	20	20	19	2⅞	6⅞	19	5¼	11⅛

CLINICAL AND LABORATORY NOTES

A CASE OF ALEUKÆMIC LEUKÆMIA.

BY ARTHUR W. BRODRIBB, M.B. OXF.,
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AND
P. LAZARUS-BARLOW, M.B. CAMB.,
PATHOLOGIST TO THE HOSPITAL.

A FARMER, aged 65, was admitted to the Royal East Sussex Hospital in January, 1930. For nine weeks he had been complaining of severe abdominal pain on the left side.

On admission he was looking extremely ill and was suffering from abdominal pain, vomiting, intractable hiccough, and laboured breathing. His temperature was 104° F., his pulse-rate 132, and his respiration-rate 28. His skin was of a lemon tint and his thyroid gland was enlarged to the right. There were no definite abnormal signs in the heart or lungs. The abdomen was enlarged, with a regular contour. The spleen was palpable four fingers' breadth below the costal margin, having a definite notch. The liver was palpable just below the ribs. The kidneys were not palpable. The urine contained some albumin, with pus and epithelial and granular casts. The reflexes were not abnormal. The teeth were few in number but carious. There were no hæmorrhages.

The *blood count* showed: hæmoglobin, 60 per cent; red blood corpuscles, 2,200,000 per c.mm.; leucocytes, 6600 per c.mm.; colour-index, 1·4. The differential count showed: polymorphonuclear cells, 0; eosinophils, 0; large mononuclears, 6; large lymphocytes, 71; small lymphocytes, 23. Twenty-two nucleated red cells were seen per 100 leucocytes.

The *clinical course* was rapid deterioration. The patient became deeply jaundiced, with high fever, dyspnœa, and coma; and death occurred four days after admission. No hæmorrhages occurred.

Post-mortem examination was carried out two and a half hours after death. The body was that of a well-developed, well-nourished man. There was marked jaundice. Rigor mortis had not set in. The heart was flabby and the muscle soft. The endocardium was deeply bile-stained. The valves were competent and the coronary arteries patent.

The cervical and paratracheal glands were enlarged and pinkish. The right lobe of the thyroid gland was considerably enlarged and was pressing on the trachea, causing some narrowing. On section the colour was dark red, with yellow areas. The weight of the gland was 4½ oz. Histologically, little thyroid tissue was seen. The greater part of the section was taken up by large areas of hæmorrhage in which the acini were small and compressed. In these areas were masses of degenerated cocci and numbers of large lymphocytes.

The lungs showed some congestion of their bases but were otherwise healthy. The stomach and intestines were healthy. The liver showed some perihepatitis. On section the liver substance was soft and fatty. The spleen weighed 74 oz. and extended to a full hand's breadth below the costal margin. On section it was dark red in colour and very congested. Stained films from the pulp showed enormous numbers of large lymphocytes. The pancreas appeared healthy. There was a large mass of glands on either side of the vertebral column immediately beneath the pancreas and these were forcing the head of the pancreas upwards, thereby causing obstruction to the ampulla of vater. The common bile-duct was patent. The kidneys and suprarenals seemed healthy. There was some decrease in the reticulum of the abdominal glands and areas of hæmorrhage and infiltration with mononuclear cells were seen, as in the spleen.

The blood picture, taken in conjunction with the post-mortem findings, suggests aleukæmic lymphatic leukæmia. The other unusual features are: (1) the blood picture presenting 100 per cent. mononuclears; (2) the condition of the thyroid gland, which appeared to be that of an abscess which had ruptured into a vessel; (3) the great mass of glands on either side of the vertebral column in the abdomen beneath the head of the pancreas, pressing it upwards and so obstructing the ampulla of Vater.

FATAL HÆMORRHAGE

IN RADICAL OPERATION FOR TRIGEMINAL NEURALGIA

FOLLOWING INJECTION TREATMENT.

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AND

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LATE HOUSE PHYSICIAN TO THE WEST END HOSPITAL.

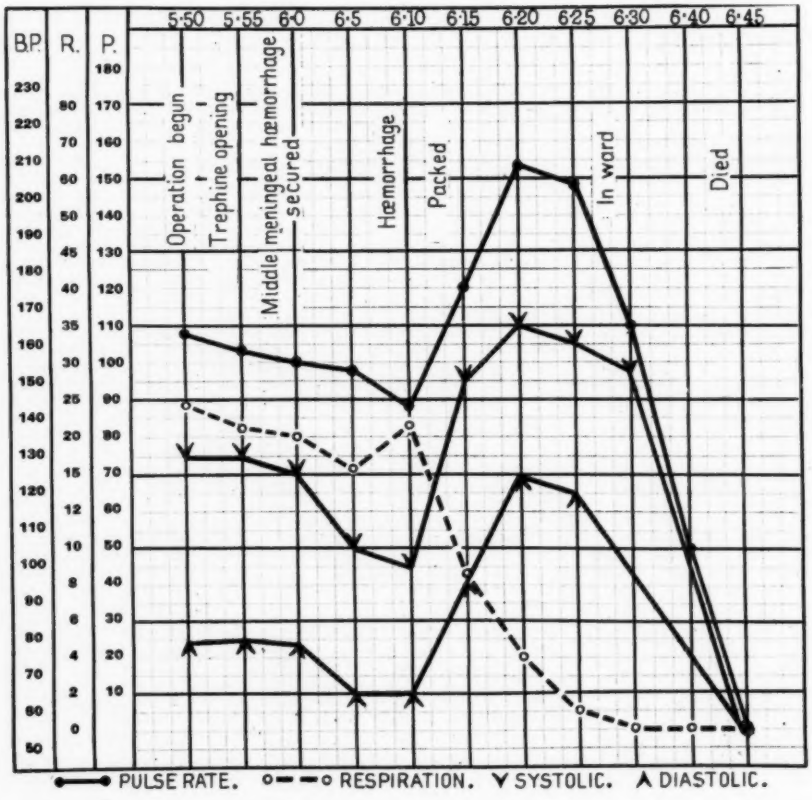
THIS case illustrates the difficulties and dangers which may be experienced in performing the operation for division of the sensory root of the Gasserian ganglion in trigeminal neuralgia after repeated attempts to cure by alcohol injection.

The patient, a male aged 61 years, gave a history of neuralgic pains for some 20 years. Within the last three years these had become much more severe. During attendance at a hospital for one year previous to operation he had had three alcohol injections into the affected nerves, the longest period of relief following this form of therapy being three weeks. For some weeks before admission for operation patient had been unable to sleep because of severe pain, and was "sitting up" at nights. He was in rather an exhausted condition and was not a good operative risk.

All three divisions of the trigeminal nerve were involved. Spasms of pain began at the right angle of the mouth and spread thence up the right cheek, right side of nose, round the eye, and then over the temporal region upwards to the vertex. Downwards, the spread was round the right side of the jaw. Attacks of pain were readily brought on by slight stimuli, especially by attempts to open the mouth, the patient being in consequence afraid to eat. The right side of the face was slightly flushed, and hyperæsthesia was evident over the distribution of all three divisions of the nerve. The right side of the tongue was dry and furred and there was slight epiphora of the right eye. A radiogram of the skull was normal. The cerebro-spinal fluid showed one cell per c.cm., a total protein content of 0·03 per cent., and no excess of globulin. The Lange test gave: 0111000000, and the Wassermann was negative in blood and cerebro-spinal fluid.

At operation the subtemporal route, as described by Frazier, was followed. Separation of the dura from the base of the skull was proceeding with some difficulty, owing to adhesions, when the middle meningeal artery ruptured. Hæmorrhage was severe, rendering subsequent progress difficult. Adhesion of the dura to the skull-base was now found to be extraordinarily firm, and separation of it, in process of elevating the brain, became increasingly difficult. During the final stages of approach to the ganglion a sudden severe hæmorrhage took place, and as this could only be controlled by firm and extensive packing, the operation had to be abandoned and the patient was returned to the ward. Respiration had ceased meantime, but the pulse was good in quality, though rather rapid; artificial respiration was instituted but without avail, and the patient died some 20 minutes after leaving the theatre.

In accordance with our routine practice in all operations for brain conditions at the West End Hospital, a record of blood pressure, pulse-rate, and respiration-rate was kept throughout the operation. The chart here given presents some points of interest. After the severe hæmorrhage occurred the respiration-rate fell rapidly and eventually to zero, where it remained, but the blood pressure—systolic and diastolic—and pulse-rate continued to rise until shortly before death, when these also fell rapidly to zero. The blood pressure and pulse-rate appear to have started to rise before the onset of hæmorrhage, according to the chart, but it must be remembered, in view of the post-mortem findings, that blood was extensively diffused throughout the base of the brain and around the pons before the hæmorrhage appeared in the wound, and that packing was then introduced which raised the intracranial pressure still further.



Anæsthesia chart of operation under open and intratracheal ether (6 ounces). B.P. = blood pressure; R. = respiration; P. = pulse-rate.

POST-MORTEM FINDINGS.

Within 24 hours of death a post-mortem examination was carried out by Dr. W. E. Carnegie-Dickson, who reported as follows: "Large anteroposterior tear, 1¼ in. long, in centre of floor of the middle fossa. Small tear, or wound, in the internal carotid artery just before it subdivides—little bit of clot lying in opening, partly in and partly outside. Very extensive subdural hæmorrhage all over base, &c., and round pons and medulla. Tip of temporal lobe broken up (by this hæmorrhage?). Cavernous sinus intact. Gasserian ganglion surrounded and very firmly bound down by fibrous adhesions (this probably accounting for dura giving way when levered up)."

DISCUSSION.

It is evident that several factors contributed to the fatal result. Of these the most important was the density and firmness of adhesions in the operation region. In our opinion these adhesions were brought about by the previous injections of alcohol in the neigh-

bourhood of the ganglion itself. Kulankampff [1] refers to the inevitable formation of adhesions following such injections. That such effects, due to the irritation of the alcohol, may be quite extensive may be deduced from the interesting experiments performed by Wilfred Harris.[2] He showed that injection of the foramen ovale in the cadaver with one cubic centimetre of methylene-blue solution almost invariably stained the whole of the ganglion deep blue, and not the ganglion only, but also sometimes the wall of the cavernous sinus, the anterior surface of the pons, and even to a lesser extent the opposite cavernous sinus. Such wide spreading of the alcohol, he maintains, explains how cranial nerve paralysis may occur when the injection is done too rapidly. In this connexion it is of interest to refer to a case published both in America and in this country of a girl, aged 20, in whom paralysis of the sixth, seventh, and eighth nerves followed injection and remained permanently. Unfortunately, also, the neuralgia returned after six weeks and a Gasserian operation was performed, the sensory root of the fifth nerve being avulsed, finally curing the neuralgia. Stookey [3] even goes so far as to say "the latter procedure (i.e., injection) should be used only when diagnosis is doubtful, since the patient will come to the operation eventually." This, of course, is not the view held by other authorities, notably Wilfred Harris in this country. The difficulties confronting the operator when firm dural adhesions are present is also recognised by Frazier,[4] who says, "occasionally the dura is so adherent that laceration is unavoidable." Harris [5] also draws attention to the fact that alcohol, when injected into the tissues, causes later the development of a fibrositis, and subsequent injections may be hindered by the toughness of the tissues impeding the facility of needle-manipulation when searching for the nerve. Surely this observation applies with even greater emphasis to the difficulties which may ensue when radical operation itself is tackled after injection treatment has failed. It is also, of course, common knowledge that impairment of the function of the pterygoid muscles sometimes results from a fibromyositis in these muscles caused by leakage of alcohol into their substance in the process of alcohol injection.

In the case dealt with here another factor of importance was the arteriosclerotic condition of the vessels. The middle meningeal, for example, was moderately degenerated, and very slight handling was sufficient to cause rupture. It is of interest to note further that, in this patient, the internal carotid was unduly tortuous and lying in a somewhat abnormal position in its intracranial course; it was thus probably rendered more liable to damage in the event of the dura being ruptured. A. R. Cadarso and J. J. B. Goyanes,[6] also J. Cairney,[7] all refer to the unusual tortuosity which sometimes may obtain in the internal carotid artery.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF SURGERY AND PATHOLOGY.

AT a combined meeting of these Sections held on Feb. 4th, Mr. C. H. FAGGE (Surgery) being in the chair, a discussion on the indications for, and the value of, the

Intravenous Use of Germicides

was opened by Mr. V. ZACHARY COPE (Surgery). He would begin, he said, by defining his terms. By "germ" he meant any pathological micro-organism, whether protozoal or bacterial; by "germicide" he meant any substance of known and fixed chemical composition which would kill germs, either directly when brought into contact with them or indirectly by unfavourably affecting their environment in the body. To confine the discussion to direct bactericidal effects would be to omit valuable data. To be of value a germicide should have only a small toxic action on the host in the doses employed; the intravenous route was chosen when administration by the alimentary tract was contra-indicated because of its irritant effect, or because its value was diminished by the body liquids. When the diseased condition was widespread in the body, the intravenous was the ideal route, always on the understanding that the body tissues were not deleteriously affected. The germ-killing efficacy of a preparation was arrived at either in the test-tube or in animals, but the supreme proof must always be the clinical effect in the human subject. He recalled that salvarsan was ten times as lethal to the Leishman-Donovan body in vitro as was tartar emetic, but in the human subject salvarsan was no good as a treatment for leishmaniasis, whereas tartar emetic was specific. Intravenous therapy had been more successful with protozoa than with bacteria. Striking examples were the effects of compounds of arsenic upon the spirochætes of syphilis, framboesia, and relapsing fever, of the compounds of antimony on the Leishman-Donovan body, of emetine hydrochloride on the *Entamœba histolytica*, and of quinine on the parasite of malaria.

The intravenous injection of germicides in the case of bacteria was not on so sure a foundation as in the case of protozoa. According to Prof. Alexander Fleming none of the ordinary antiseptics had a bactericidal effect in the blood stream; but there was reason, he thought, for expecting the production of a substance having definite value as a universal germicide when put into the blood stream. The intravenous injection of salvarsan had received clinical justification in malignant pustule, but for the septicæmic or generalised form of anthrax salvarsan was admittedly useless. Morgenroth reported optochin efficacious in pneumococcal pneumonia, but clinicians found it disappointing for two reasons: blindness sometimes followed its use, and it did not cure the infection. In leprosy, remarkable results had been reported from the intravenous injection of sodium salts, before the work of Leonard Rogers had shown the value of chaulmoogric and hydnocarpic acids. No direct bactericidal action on the causal organism was claimed for these drugs; they were indirect germicides. Sanocrysin was at one time spoken highly of, but the present opinion was that it had no direct, and only a doubtful indirect value in killing the tubercle bacillus. As its administration was not devoid of danger, the field for its use was restricted.

In the treatment of severe septic infections claims had been made at different times but regretfully it could still be said that no reliable drug for intravenous use in these cases had yet been found. A good trial had been given to both mercurochrome and the aniline dyes, but no one who had followed the work of A. Fleming could continue to believe that the commonly used antiseptics could exert any direct effect on organisms in the blood stream except in a strength which would poison the patient. Any effect which was traceable to them must be regarded as indirect. The clinical results were variable and unconvincing. In some cases it seemed that the disturbance following the giving of the drug had been a factor in the recovery which eventually ensued. The use of any of these drugs in a generalised infection seemed to him to be a shot in the dark.

Both surgeonsand physicians had shown themselves, Mr. Cope thought, too ready to try a remedy because it was new, rather than because it had been proved to have good credentials. They were apt to believe that a drug had cured the disease because recovery followed its use. On the other hand, the laboratory worker was apt to lay down hard and fast laws. A closer coöperation between the two groups was to be encouraged.

Prof. ALEXANDER FLEMING (Pathology) said his definition of a "germicide" was quite simple—viz., something that killed microbes. Alternatively it could be expressed as a substance which entered into destructive combination with the microbe. If one were to include some mysterious power brought forth in the blood whereby its antibacterial effect was increased, then a vaccine came into the category. Nuclein was an indirect germicide; injected into a vein it increased the germicidal power of the blood. He did not intend to include in his remarks the action of drugs on protozoa. If, he said, one could not produce in blood outside the body a germicidal effect with the substance proposed, it was of no use to try to cause a germicidal effect with it in the body itself. Two conditions must be fulfilled: one must be able with safety to obtain a concentration of the germicide in the blood which would kill the microbes, and that concentration must last for a sufficiently long time for the microbes to be killed. A point to be remembered was that microbes varied in their readiness to succumb; a chemical which had a pronounced effect on one would, in the same strength, leave another apparently unharmed. If a germicide was injected into the blood, it must be at its maximum concentration as soon as it was injected. If immediately after injection one did not find a germicidal action, then a direct action could not be expected. There were various ways of testing the germicidal action of a chemical in the blood as well as the bactericidal power of blood or serum. At St. Mary's a very simple method had been developed. Some blood was taken, and mixed with anything chosen; the mixture was run between two slides and placed in an incubator, the number of colonies which developed being noted. Ordinary blood itself possessed considerable power of killing bacteria, a power which was centred in the leucocytes. Removing the leucocytes from the blood left a fluid chemically the same as blood but with no power over ordinary microbes. It was obvious, he said, that any germicide injected intravenously would be at its maximum concentration in the blood immediately after the injection—i.e., before there was time for it to be removed from the circulation. So the greatest germicidal effect should be manifest during the first few minutes after the injection was made. Many germicides which had been recommended for intravenous injection had been tested and few had passed the two conditions.

Prof. Fleming showed numerous diagrams illustrating the results of mixing blood containing a known number of bacteria with dilutions of various germicides. The effects were judged by the number of colonies developing in a slide cell during subsequent incubation. In practically every case the germicides damaged the leucocytes in a higher dilution than they damaged the bacteria, with the result that the bactericidal action of the leucocytes was prevented, and a greater number of colonies appeared in the test cell than in the control, which contained no germicide. The concentrations required in the blood to kill bacteria, as determined by this method, were such as to demand enormous and quite impracticable doses. This consideration applied to eusol, the mercury salts, mercurochrome, flavine, monsol, gentian, violet, and sanocrysin. Although these results held out no hope of exerting a direct bactericidal action in the blood, it appeared that high dilutions of salvarsan, not in themselves bactericidal, increased the bactericidal power of the blood for *Streptococcus pyogenes;* there was no such effect on *S. salivarius*. This action, which he was unable to explain, indicated that factors were at work which were not understood.

DISCUSSION.

Mr. P. H. MITCHINER said that chemical antiseptics given intravenously must be of such strength as to have the optimum lethal action on the micro-organism, without impairing the defensive utility of the leucocytes or other tissue cells. And as it must be at the moment of injection that the maximum action in the blood stream would take place, it must be admitted there was small hope of getting a direct germicidal action from this procedure. His experience had led him to feel certain that in the majority of cases the intravenous injection of so-called germicides was more harmful than beneficial to patients with septicæmia. He knew of no criterion, in any individual case, as to the dose of germicide which would give the most beneficial result; at different stages of the illness different doses constituted the optimum, and the test-tube results were not a guide to what was likely to happen in the body. At St. Thomas's Hospital sanocrysin was used in 20 cases of tuberculosis, and the results were negative, though it was thought to have value in acute pneumonic cases. In streptococcal and staphylococcal septicæmias, he found a tendency among surgeons to withhold such drugs as mercuric chloride and mercurochrome until the patient was moribund; showing no great confidence in them, but using them rather as a sort of desperate last throw. Moreover cases were occasionally seen in which the septicæmia suddenly took a turn for the better without any special treatment, and in those circumstances it was at least courageous to attribute the improvement to a drug. Increased germicidal power in body tissues he attributed to protein shock, an alteration for the better in their resistance balance.

Dr. T. H. C. BENIANS thought it probable that the answer of a probationer nurse to a question on disinfectants was not very wide of the mark: "Disinfectants are nasty dangerous things; they kill bacteria and human beings." Pneumonia he regarded as a massive abscess; nothing put into the blood was likely to get into that. Those who worked at staphylococcic septicæmia in rabbits knew that there were abscesses in the kidney, and these caused the death of the animal. He did not know how far Fleming's work had traversed that of Colebrook, but in 1927 the latter demonstrated the bactericidal power of

serum to hæmolytic streptococci, and devised a method of showing how much damage had been done to the phagocytic tissues of the body. In many ways the leucocytes of the blood stream were some of the least permeable cells in the body; they were not to be relied upon as a basis for judging of the damage to the phagocytic tissues. Colebrook had shown that the great trouble lay with the abscesses, and suggested that surgeons might be able to do something more drastic to clear up these. He did not think it should be said that intravenous germicides were impossible. He suggested that those who issued germicides should supply with them a form giving clinical and pathological data certified by the Medical Research Council or similar body; this should enable the clinician to determine what was likely to be efficacious in any particular type of case.

Dr. L. P. GARROD showed a diagram illustrating the bactericidal and bacteriostatic actions of five germicides on *Streptococcus pyogenes* in the presence of blood. Having regard to the concentration attainable in the circulating blood by intravenous medication, it appeared that none of these could be capable under such conditions of killing streptococci, and only one, acriflavine, was calculated to exert even an inhibitory action on their growth in the blood stream. The very poor results given by mercurochrome were entirely at variance with the generally accepted opinion of its powers, and he believed that a false idea of these had gained currency owing to Young's original work on the drug having been conducted with dilutions made in acid urine. Whereas Young claimed that mercurochrome killed *Staphylococcus aureus* in 15 minutes in a dilution of 1 in 10,000, four other investigators besides the speaker had failed to obtain bactericidal action with dilutions varying from 1 in 50 to 1 in 400 in neutral media, such as distilled water or blood. A probable explanation appeared to be that acids decomposed the drug, liberating a mercury salt much more actively bactericidal than mercurochrome itself.

Dr. G. W. M. FINDLAY agreed that protozoal diseases were fairly easily eradicated—e.g., bilharzia by antimony salts. Bacterial diseases were almost entirely unaffected by chemotherapeutic agents. In kala-azar the tetravalent antimony compounds had no action in vitro, yet they were very efficient in vivo. It was usual to allow the disease to go on for some weeks before giving the remedy. A parallel case was that of malaria treatment of general paralysis of the insane. Colonel James had shown that if quinine was given to a patient during his first attack of the fever, the malaria parasites were not eradicated; but if one waited until the patient had a good dose of fever before giving quinine, then it was a success. It had been found that the antitoxin content of the blood could be raised by the injection of such substances as manganese, though they had no direct specific action on the bacteria. It was possible that eventually chemotherapeutic drugs would be found which might stimulate the formation of immune bodies in bacterial diseases, and so lead to their eradication, not by a direct action on the bacteria but by harmonising with immune body activity in the tissues.

Dr. E. BOUSFIELD pointed out that there was now available a more efficient antistreptococcal serum than five years ago, and this enabled one to approach cases of hæmolytic streptococcal infection with more prospect of success.

Dr. J. BURNFORD suggested that work on germicides should not be left entirely to the laboratory. There were many infections associated not with the activity of the leucocyte but with that of the lymphocyte. He would have liked to hear physicians give the results they had found from the use of reputed germicides. He could speak of an absolute cure of a case of staphylococcic pyæmia after using perchloride of mercury, and his experience of subsequent cases of the same kind treated in the same way had impressed him. On infective endocarditis he found germicides had no effect. He had seen rapid results from calcium salicylate in rheumatic infections.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

AT a meeting of this Section held on Feb. 10th the chair was taken by the President, Dr. PHILIP HAMILL.

Dr. E. P. POULTON opened a discussion on the use of

High Carbohydrate Diets in Diabetes.

He expressed dissatisfaction with the usual form of treatment, especially for children. The need for insulin, he said, almost always seemed to increase, and he had tried the high carbohydrate diet with the feeling that the results at any rate could not be worse. He outlined the arguments in favour of the high carbohydrate ration, towards which, he said, there had been a considerable movement during the last year or two, and described 27 cases in which satisfactory results had been obtained.

The average sedentary individual, he said, took about 200 or 250 g. of carbohydrate in a day. He then showed charts illustrating the old diabetic ration of carbohydrate—varying from 13 g. to 120 g. —and the increase of the carbohydrate-insulin ratio in diabetics who had been allowed 190 g. or more. In many of the cases the dose of insulin required had steadily decreased, though it usually remained about the same in children. A girl, aged 9, who had done badly under conditions of home management which were ideal for the old treatment, had done much better as soon as the carbohydrate was increased. The method of determining the ratio was the most perfect possible, a selected week having been chosen from records kept regularly for months.

Everybody treated with insulin should be given these high diets; patients felt much better with them. They were definitely indicated in phthisis, angina pectoris, arterio-sclerosis, and high blood pressure. Standard formulæ would greatly assist the calculation of the diets; Dr. Poulton showed such a formula with a carbohydrate ration of 20 g. and a fat ration of 10 g., the protein being added up at the end. With this diet it was important to give the insulin as long as possible before the meal—an hour, or even an hour and a quarter. The body had much more carbohydrate stored in it, and much more of the insulin was occupied in dealing with this, so that there was no sudden fall of blood-sugar.

OBJECTIONS TO THE HIGH CARBOHYDRATE DIET.

Dr. R. D. LAWRENCE said he had used these diets experimentally in 1926 and 1927, but had found it difficult to make life pleasant for the patients, as hypoglycæmia threatened and was very variable in its manifestations He had done some experiments on the carbohydrate-insulin ratio; he had found that a patient taking 20 g. of carbohydrate and 20 units of insulin required 75 g of carbohydrate to 30 units of insulin and 120 g. to 40 units. Thus 16 units of insulin, given fasting, in this patient was using 80 g. of carbohydrate from the tissues, making the insulin-glucose equivalent 1 : 5 He agreed that much more

carbohydrate should be used than formerly; on an average between 70 and 120 g. per day. On this amount patients need not weigh their protein and fat, which was a great advantage; most patients got all the toast, bread, and fruit they wanted, and needed only two doses of insulin a day On the high diets—at any rate in America—three or even four doses were needed. The easiest life was the life of choice for these patients. High carbohydrate diets meant more expense and more trouble.

Dr. T. C. HUNT mentioned striking results he had seen from Prof. Falta's standard diet of 165 g. of carbohydrate, allowing the patients to adjust the fat to taste. The object of a low carbohydrate diet must be to obtain some regeneration in the islet cells. This was not known ever to have occurred, and there was a suggestion that the cells, at any rate, after a rest, required some blood-sugar for their recovery. Muscular development in growing children, tuberculosis, infective states, and pre-operative periods, all called for higher carbohydrate diets.

He showed figures from a number of patients who had broken their rules and taken a full carbohydrate diet. In several cases the blood-sugar had risen enormously without any glycosuria. This was regarded as a very serious condition; the development of this high threshold was probably a bad sign. Other cases had done quite well. In another series of cases the low carbohydrate diet had been maintained and in all of these glycosuria had persisted and the blood-sugar had risen. The two sets were not strictly comparable, but did not show the marked difference that might be anticipated. The advantages of the high diet were that the patients could do more work and could direct their diet by appetite and live a less fussy life. Carbohydrates were cheap foods, and more fat could be given with them to increase the total calorie intake. It was difficult to say how much of the benefit was due to the raised carbohydrate and how much to the greater calorie value in the high carbohydrate diet. Diabetics seemed to be either stationary or progressive from the first, and the amount of carbohydrate allowed—between 50 and 150 g.—had little effect on the ultimate outcome.

THE PATIENT'S TASTES AND HAPPINESS.

Prof. J. A. NIXON said he had been using the higher carbohydrate diets since 1922, as he believed that the object of insulin therapy was to allow normal amounts of carbohydrate as far as possible. He did not claim that more patients had been enabled to do without insulin, but he was convinced that the patients kept their régime very much better and grumbled less. To get in the full amount of fat prescribed had always been a difficulty with the old diets, but about 70 g. were taken easily. He never prescribed a diet without seeing first what the patient did on the diet of his own choice. Patients did not often overstep 150 g. of carbohydrate when lying at rest. Most people would be quite content to cut down their carbohydrate to conform with two daily injections of insulin. It was much too early to say whether or not the higher or—as he preferred to call it—the adequate carbohydrate diet was affecting the arteries, but Joslin said that the age of arterio-sclerosis seemed to have been postponed.

Dr. A. P. THOMSON described satisfactory results from the high carbohydrate diet. He had found that out-patients who broke their dietary regulations had done rather better and were certainly healthier and happier than those who had obeyed, although their blood-sugar was higher. He now had records of 400 cases on high carbohydrate diet. He agreed that protein and fat in these diets should be determined by the patient to taste. This greatly simplified instructions; patients were simply told to take so many carbohydrate rations. Clinically they remained in good condition, and laboratory investigation had shown no serious results; the blood-sugar remained fairly constant. No healthy person took exactly the same amount of protein and fat each day; the amounts varied with exercise and other factors. Men lived in homes and not in calorimeters. It had been alleged that low blood-sugar encouraged recovery of islet tissue, but in Dr. Thomson's experience there was never improvement after the first six months. It was therefore worth ordering rigid diet for six months in an early case, but not for longer. One of the troubles of mothers was the obesity of the trunk developed on a low carbohydrate diet; the children's figures were much improved by the higher diets.

Dr. O. F. LEYTON stressed the importance of treating individuals. A standard diet was a medical impertinence. His methods were those of Prof. J. A. Nixon. The average carbohydrate ration was 120 g. daily, and most people were satisfied with that. Cases that were not very mild needed expensive doses of insulin if they were to have high carbohydrate diet. Others showed a tendency to hypoglycæmia. There were many exceptions to the rule that recovery was not seen in the pancreas after the first six months. In hospital patients it was very exceptional to be able to keep the blood-sugar steadily below 0·15 per cent. Alcohol might act as a deterrent in the regeneration of the pancreas.

Dr. GEORGE GRAHAM thought the carbohydrate should be increased to the region of 100 g. a day. The ratio between the increase of carbohydrate and the dose of insulin varied considerably. Children who swing very readily from high to low blood-sugar were much easier to control on the new diets. The right balance between fat and carbohydrate must be determined, but would require prolonged clinical observations. It was difficult to keep some patients free from acetonuria before their doses of insulin; the risk of coma, if the insulin were for any reason omitted, might prove much greater for patients on the high carbohydrate diet.

Dr. P. J. CAMMIDGE said that he had never believed that insulin would cure diabetes, and had always regarded it as a means of securing an average diet. To this the new diets were approximating. A good deal depended on the ratio between carbohydrate and fat. The high diets were particularly useful for children, who were much happier on them, and—with few exceptions where there were associated pituitary disturbances—did extremely well. It was very difficult to obtain a carbohydrate-insulin ratio with any accuracy, because of the great variation in the absorption of foodstuffs. The nearer the diet of a diabetic approached to a normal average diet the better.

Dr. PAUL WEISS (Homburg) agreed that insulin should be used to give patients the benefits of full diet. Some authorities preferred small amounts of carbohydrate with large amounts of fat; this was an acid diet, while the high carbohydrate diet was an alkaline one, and less likely to lead to acidosis. The best diet of all was the vegetable diet; this meant plenty of calcium, which was especially important for children, though calcium was needed by all diabetics. An alkaline diet—e.g., carbohydrate with milk, fruit, and potatoes—was a calcium-conserving

diet. Insulin injections should be given strictly to time, preferably every eight hours, especially with high carbohydrate diets. This ensured better nights, with less risk of hypoglycæmia in the night. The prevention of coma lay in the care of the blood-sugar. The best diet for this purpose was high carbohydrate and vegetables with insulin.

Dr. POULTON, in reply, said that there was a consensus of opinion that carbohydrate diets should be raised; the problem was by how much? He had had no difficulty with hypoglycæmia provided the patients did not do foolish things. He had not noticed the raising of the threshold.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on Feb. 9th Dr. R. A. YOUNG, the President, took the chair, and a discussion on the

Choice of Anæsthetics

was opened by Dr. I. W. MAGILL. Anæsthesia, he said, had done much to help the progress of surgery, and for a long time the surgeons were satisfied if their patients were presented to them sufficiently anæsthetised, the method of bringing about that state seldom being questioned. But successful results, especially nowadays, could seldom be got by mere dexterity of the surgeon alone; they were the products of well-organised team-work in which the anæsthetist took an important share. Chloroform and ether would produce good operative conditions for the surgeon when administered in a simple way, but their wholesale or routine use was not always in the patients' best interests. Both were definitely toxic, and did nothing to absolve the patient from unpleasant anticipation. Moreover, the recovery period, with its nausea and discomfort, was an experience few wished to repeat, so that often the anæsthetic was dreaded more than was the operation. The search for other agents had been largely determined by the desire to limit the quantities of chloroform or ether used, or to dispense with them altogether. This search had resulted in the trial of morphia, scopolamine, nitrous oxide and oxygen, ethylene, local and spinal anæsthesia, avertin, paraldehyde, and the derivatives of barbituric acid. It could be said that, except intraspinal percaine, none of these administered alone and in safe dosage would produce operative conditions in the abdomen as good as those obtainable with chloroform and ether. It was in efforts to avoid the disadvantages of each that progress had been made towards better anæsthetics, to what Lundy, of the Mayo Clinic, had called "balanced anæsthesia."

Dr. Magill claimed that ethylene was much more satisfactory than nitrous oxide; it gave better relaxation, and could be used with as much as 20 to 30 per cent. of oxygen. It was especially valuable in thoracoplasty, in which suboxygenation was undesirable and a speedy return to consciousness very important. Risk of explosion confined its use to cases in which cautery or diathermy was not employed.

The greatest advances had been made in the field of basal hypnosis, which protected the patient from psychic shock. He had no recollection of the journey from bed to operating theatre, nor of the induction period. Also it was possible greatly to reduce the quantity of anæsthetic used, so that ether could often be dispensed with, while post-operative nausea and vomiting were either abolished or greatly reduced. Amnesia or sleep followed for a definite period after the operation, but the patient might be restless during this unconscious period and had to be watched. The most valuable basal hypnotics available were paraldehyde, avertin, and some derivatives of barbituric acid. The first of these was administered per rectum, the average dose being reckoned as one drachm per stone of body-weight. It was given quite slowly one and a half hours before the operation, in ten times its quantity of normal saline. Atropine was given as usual, and morphia to adults. Paraldehyde was specially useful for children, but tact and skill were called for. Avertin was also given per rectum, the dose being 100 mg. per kg. of body-weight, so dissolved in water as to make a 2·5 per cent. solution. Barbiturates must be toxic enough to give full effect on a small dose, their action must be sufficiently short, and they must be administrable by intravenous injection. Any of the barbiturates—which included luminal, allonal, medinal, veronal, and dial—would produce hypnosis, and their important feature was the long period of sleep after the operation, which might be 24, even 36 hours. Dr. Magill had a good word for three of the barbiturate preparations, placing them in the following order of merit: nembutal, sodium amytal, and pernocton. He regarded nembutal[1] as the most outstanding anæsthetic drug to date, one which was sure to be of great value in medical practice—i.e., in epilepsy, convulsions, eclampsia, delirium tremens, hysteria, and any nausea. The popularity of spinal anæsthesia had oscillated, depending on the discovery of some new drug, but he thought much of the hostile criticism directed against stovaine was due to faulty technique. The drawbacks of spinal analgesia were not entirely due to the toxicity of the drug; they were referable mostly to the fall of blood pressure which followed spinal puncture; and if measures were taken to circumvent this fall—e.g., by the use of ephedrine—the disadvantage was greatly reduced. At the Mayo Clinic, spinal analgesia with novocain was the anæsthetic of choice for almost all abdominal operations. Percaine was effective in such a high dilution as 1 in 1500 so that its toxicity was a negligible quantity, and it gave a long period of anæsthesia. With percaine the relaxation for a high abdominal operation was complete, and this was a valuable asset in the type of patient who was difficult to relax, even under deep ether or chloroform anæsthesia.

Dr. Magill also referred to the value of carbon dioxide. This respiratory stimulant enabled the anæsthetist to hasten induction when respiration of the patient was sluggish, or to secure a deeper inspiration during the course of the operation, while towards the end of the surgeon's work it hastened the elimination of the anæsthetic and the re-establishment of activity at the pulmonary bases. He concluded by pointing out that what might be a safe drug or a safe apparatus in the hands of one person might be a source of danger when entrusted to another, for always it was the anæsthetist who counted.

DISCUSSION.

Sir FRANCIS SHIPWAY said that every surgeon and physician knew that slow induction with gas followed by deep ether anæsthesia often produced bad results, not only in respect of vomiting, but also of pulmonary complications. It was often said that the mortality

[1] Magill, I. W.: THE LANCET, Jan. 10th, p. 74.

after chloroform was high, but he thought the mortality from ether was equally high, as could be ascertained by following cases up afterwards. Local block infiltration and spinal anæsthesia had been used now for some years, but surgeons in this country were noticeably reluctant to agree to their use, largely because, from the surgeon's standpoint, the anæsthetist had provided such an effective narcosis. Sir Francis now thought that spinal anæsthesia ought to be more used, certainly for the upper abdomen. Nembutal and avertin could be employed with great satisfaction to both patient and surgeon. He did not propose to make any comparison between these two drugs, there was room for both; indeed there seemed to be a great future for nembutal. Whether it should be given by the mouth or intravenously was, he thought, open to question. Avertin he regarded as an extraordinarily valuable drug, and he preferred it to paraldehyde, especially for children. Many children had had tonsillar enucleation done, and even appendicectomy, without knowing that they had had an operation. Statements such as that these drugs were not safe for throat work, that they abolished the cough reflex, he had not found confirmed in his experience. He was using them frequently, and saw no disadvantages from their employment. He did not think it fair to say one ought not to anæsthetise a patient for a nose operation without using the intratracheal method; nowadays he never used the latter method, though he gave anæsthetics for many nose and throat cases. Generally speaking, the simpler the method the better for the patient. The apprehension or terror he regarded as so important that every endeavour should be made to minimise it. The basal narcotics got over this difficulty, and made one reflect that if only these had been available during the war, an immense amount of mental anguish and suffering might have been avoided.

Dr. C. F. HADFIELD thought Sir Francis Shipway had exaggerated the danger of pulmonary complications after ether anæsthesia. He regarded the various forms of basal anæsthesia as somewhat erratic in their action.

Mr. C. HAMBLEN THOMAS asked whether any particular form of anæsthesia was associated with the prevalence of pulmonary abscesses after tonsil operations. For operations on the upper air passages he had found paraldehyde easy to work with; patients were sleepy and did not struggle.

Dr. GEOFFREY MARSHALL said he frequently saw cases with pulmonary complications after operation, and he shared Sir Francis Shipway's dislike of chloroform and ether as anæsthetics; they were primitive, and it was high time they were displaced by others. During the later stages of the war gas and oxygen was chiefly used, with local infiltration of the abdominal wall with novocain, and the results were so good that he was surprised that this did not afterwards become the routine. The novocain injection took no more than two minutes, and the relaxation of the abdominal wall was complete. He was not contending that this was the best anæsthetic now. In future, patients would demand to be put to sleep with the anæsthetic while they were in bed; this enormously reduced distress and apprehension, and he believed it facilitated recovery.

Dr. A. W. MATTHEW thought it was a mistake to base the dosage of basal hypnotics entirely upon the weight of the patient; his idiosyncrasy and general state ought also to be considered.

Sir JAMES DUNDAS-GRANT spoke of a good experience he had had for ear, nose, and throat operations with avertin, which he regarded as one of the greatest blessings the surgeon could have, especially with a patient who was not too excitable.

Mr. ARTHUR EDMUNDS said he had that day done a whole afternoon's operations under ether anæsthesia. He favoured gas and oxygen anæsthesia if it was done skilfully. He used but little spinal anæsthesia. He had lived to see many "stunts" in this domain come and go, yet they did not entirely go, for they had a use for certain cases.

Mr. ZACHARY COPE gave his own experiences with anæsthetics which had been administered to him.

Sir WILLIAM WILLCOX pointed out some dangers in the use of some of these drugs, if unskilfully used, from the toxicological point of view. The disadvantage of the basal anæsthetics was that when once they had been put into the body they could not be removed if the patient was in difficulties. In cases in which anæsthesia was induced by giving small quantities gradually there was not the same danger. Luminal he had had some experience with, and it was a very dangerous poison, one in which the margin between a therapeutic and a poisonous dose was of the smallest. He had seen many fatal cases of poisoning from the administration of the barbituric group, and if one got beyond a certain point the case was hopeless; there ensued bronchopneumonia and a rise of temperature, and recovery after that stage was reached was very rare.

The discussion was continued by Dr. Jenner Hoskin, Dr. Frankiss Evans, Mr. H. B. Butler, Mr. Hope Carlton, Dr. Parry Price, Mr. J. L. Joyce, and the President. Dr. Magill and Sir Francis Shipway replied.

LEEDS PUBLIC ASSISTANCE HOSPITALS.—The Leeds town council, by a large majority, has rescinded its recent resolution to appropriate St. James's Hospital, St. Mary's Infirmary, and the Rothwell Institution for use as hospitals under the Public Health Acts. The Minister of Health had expressed the hope that the council "would now appropriate the institutions, or at least two of them, if the full scheme was not immediately possible," on the ground that "it is essential that local authorities should avail themselves of any practicable opportunity of separating from the poor-law the accommodation required for the institutional treatment of the sick." The opinion was expressed in the council that "Leeds people know better than the Ministry of Health what is in the best interests of the city."

HOSPITAL ACCOMMODATION AT HULL.—On Thursday last week Princess Mary opened the Sutton branch of the Hull Royal Infirmary, some six miles from the city, the largest extension of that institution which has ever been made. The branch is a self-contained hospital standing in an estate of nearly 50 acres, given by Sir Philip Reckitt. The present accommodation is for 100 beds, but the buildings are so laid out as to admit of the gradual development of the hospital to over 500 beds. The cost has exceeded £100,000, of which £10,000 has still to be raised. The sterilising apparatus is said to be the first equipment of its kind that has been installed in this country. The main feature is that the sterilisers and pipes are recessed into the walls, leaving only the doors and controls visible; sterilising will be done by dry heat. The mansion, which was formerly occupied by Sir Philip Reckitt, has been converted into a nurses' home. The Hull health and public assistance committee has adopted a report of the medical officer, Dr. W. M. Frazer, upon the hospital accommodation of the city which will involve an expenditure, spread over five years, of £366,992, in addition to £59,972 for the coming year. The former workhouse, which is still used for poor-law purposes, is to be converted into a large hospital. At present there are 928 beds available for the general hospital service of the city, to which must be added the 100 provided by the Sutton branch of the infirmary, referred to above. Since, however, the Royal Infirmary provides beds for cases from the East Riding and North Lincolnshire (1,194 last year, as compared with 2996 from Hull) the accommodation available for the city is considerably reduced.

REVIEWS AND NOTICES OF BOOKS

Loyalties: Mesopotamia, 1914-1917.

By Lieut.-Colonel Sir ARNOLD T. WILSON, K.C.I.E., C.S.I., C.M.G., D.S.O. London: Humphrey Milford, Oxford University Press. 1930. Pp. 340. 25*s*.

Sir Arnold Wilson, the author of a widely read volume on the Persian Gulf and of a valuable bibliography of Persian literature, has now written a book of wider interest—namely, a personal and historical record of the campaign in Turkish Arabia which, from the number of troops engaged there, the terrible losses, the cost and the huge area covered, was one of the greatest military adventures of the world war. Some of the ground has been covered already by writers and in official publications, notably in the "Official History of the Great War," while the author himself, in his work on the Persian Gulf, has given a succinct history of the area, a task for which he was fitted by his important work alike as a civil commissioner, a political resident, and a consul-general in various parts of Arabia and Persia. But the attempt in this volume is to give within the compass of a single work a comprehensive view of the operations in Mesopotamia, so that the skill and devotion may be revealed of those who, whether from a political, civil, or military position, attempted to rehabilitate a region which had been ruined by years of misrule. The book is written with extreme frankness, and it is dedicated in simple words to the memory of a large and distinguished group of British and Indian soldiers and civilians who lost their lives during the campaign.

The references to medical administration, as a part of the military undertakings, will be the portion of the book of most immediate concern to our readers; they are numerous, and some of the details make extremely painful reading. It is an open secret that serious miscalculations occurred from the beginning, and that the horrors, whose occurrence later became common knowledge, were due to the inability of the Army Headquarters in India and of the India Office to recognise the scale of the operations which had begun. In 1916 the responsibility for the Expeditionary Force in Mesopotamia had been transferred from the Government of India to the Home Government, but the former had already appointed a Commission to inquire into the arrangements in Mesopotamia during and subsequent to 1916. The report of this Commission, with a reinforced personnel and extended term of reference, was not immediately published, probably because it was felt that the outcome of an investigation set on foot in India would not satisfy public opinion. Accordingly the British Government appointed Commissioners to inquire into the operations both in Gallipoli and in Mesopotamia, and in the latter case to report, among other things, on "the provision for the sick and wounded." The conclusions of the Commissioners closed, it will be remembered, with a serious allotment of blame, and Sir Arnold quotes the findings which revealed that the medical provision for the Mesopotamia campaign were from the beginning insufficient.

> "By reason of the continuance of this insufficiency," runs the report, "there was a lamentable breakdown in the care of the sick and wounded after the battle of Ctesiphon and after the battles of January, 1916. The defects of medical provision caused avoidable suffering to the sick and wounded, and during the breakdown in the winter of 1915–16 this suffering was most lamentably severe."

As is well known, the personal actions or inactions of certain individual medical men were subjected to severe criticism by the Commission, and Sir Arnold points to the fact that the official records confirmed these conclusions. The message of this part of his book is in keeping with the following words of the report of the Commissioners:—

> "Looking at the facts, which from the first must have been apparent to any administrator, military or civilian, who gave a few minutes' consideration to the map and to the conditions in Mesopotamia, the want of foresight and the provision for the most fundamental needs of the expedition reflects discredit upon the organising aptitude of all the authorities concerned."

Want of coöperation between military and civil authorities, which is so evident from page after page of Sir Arnold's recollections, has caused tragedies to armies many times over in the history of the world; yet, reading between the lines of Sir Arnold's recollections, it would seem that such disunion could be remedied promptly on the appearance of its symptoms, though it must become intractable with the passage of time causing a multiplication of errors and recriminations.

The format of the book is all that can be desired, and the exacting in such important matters will recognise the excellence of the bibliography and index. A map of Lower Mesopotamia—scale about 40 miles to the inch—enables the course of the operations to be followed, and many portraits of those who were prominent in them, living and dead, are included.

The Unknown Self.

By GEORG GRODDECK, M.D., author of "The Book of the It." Translated by M. COLLINS. London: C. W. Daniel Company. 1930. Pp. 207. 7*s*. 6*d*.

IN a preface to this collection of non-scientific and individualist essays the translator shows how in the history of medicine the balance of power has swayed between the artists and the scientists, vitalists and atomists, nominalists and realists, empiricists and dogmatists, or what not; and that, under the influence of the schools of psychological analysis, medicine is beginning once more to examine its fundamental principles. Dr. Groddeck has, wittingly or unwittingly, found his way back to the vitalistic standpoint of Hippocrates, who stressed "the essential unity of the organism . . . its prevision for the future, its 'initiative' in general." In place of the *physis* Groddeck offers us the *It*, which uses the ego as a mask to hide itself from the curiosity of mankind, and psycho-analysis is for him the method that leads nearest to the It. Here is, however, no exposition of that subject except so far as it is illustrated by brief clinical stories that would startle the psychoanalyst, for in them every rule of technique is broken. The non-analytically minded physician will be equally startled at the suggestion, for example, that the It may employ a germ to destroy all its guilt in a fever, or at the statement that many patients with a weekly rhythm of evacuation have been made artificially ill all their lives because they were supposed to be constipated. Nor does Groddeck spare himself—"a pious pretender, who gives honour in word and thought to the It and still, in essence, believes in his ego," who describes the origin in his infantile unconscious of "the notorious Groddeckian bark which has never since deserted me, but always gives my greeting to the morn." He is a disturber

of the peace and owes a lot to his translator, whose prefatory survey of medicine and its difficulties gives us philosophical preparation for the strong meat that follows.

Lehrbuch der Chirurgie.

Edited by W. DENK. Vienna: Julius Springer. 1930. Two vols. Pp. 869. R.M.69.

THIS book is written by 19 contributors of eminence in the German-speaking surgical world, all of them being former pupils of von Eiselsberg, to whom the book is dedicated. It is built up on the usual plan of large text-books for students, dealing with the whole of surgery including the specialties, except ophthalmic surgery. We have endeavoured by random sampling of its contents to ascertain whether this work gives full systematic and up-to-date accounts of the different branches of surgery, and have come to the conclusion that it is an excellent production. It deserves a wide public in view of the high surgical standing of the contributors. A large number of good illustrations are supplied.

Modern Sewage Disposal and Hygienics.

By S. H. ADAMS, A.M.I.C.E. London: E. and F. Spon, Ltd. 1930. Pp. 474. 25*s*.

THIS is a difficult book to classify. It is not clear to what class of readers it is intended to appeal, and yet readers of the most varied classes would find it interesting if they could be persuaded to buy it. The first chapter, on the history of sanitation and of much else, is a chatty, but concise description of the "good old times" and of the better but less picturesque times which have followed them, and is richly illustrated with reproductions of old prints. This is followed by a chapter on the Ministry of Health, and then comes the principal part of the book—a series of chapters on sewage treatment in which most of the processes which have been used in this or other civilised countries are described, mainly, it would appear, in the words of the authors of the processes. Here also the illustrations are excellent. The production of the book is good; but it is irritating to see chemical symbols written with the numbers referring to atoms in alignment with the symbols. "Carburetted hydrogen C2H2," whether or not it is available for plant life, is not usually recognised as a product of the changes going on when sewage is brought into contact with land.

This would be a useful book in the library of a medical officer of health or of a lecturer on hygiene. Those who require precise guidance in actual working or design of plant will not find here the critical discrimination which would help them. The work is, in fact, rather a compendium of information presented in a very interesting way than a text-book for the student or a work of reference for the consultant. The author may have had such an intention before him.

A Text-book of Pathology.

Edited by E. T. BELL, M.D., Professor of Pathology in the University of Minnesota, Minneapolis, Minn. London: Henry Kimpton. 1930. Pp. 627. 36*s*.

THERE has been in recent years an increasing demand for smaller text-books in medical subjects. Synopses, outlines, and "shorter" editions have been published in most branches. So far this tendency has not affected pathology to any great extent, but every teacher has had requests from students to recommend a smaller treatise than the standard works in this subject. This book, although by no means a mere skeleton, will help to meet such a demand. It actually contains 627 pages, but its large type, numerous paragraphs, and 316 illustrations take up so much space that the number of words is much less than in books such as Muir's and MacCallum's.

Prof. Bell has written the greater part of the book, but five collaborators have assisted with various chapters. The work follows the conventional division into general and special pathology, and is written in the concise and dogmatic manner necessary to keep it within a small compass. At the end of each chapter there is a select list of references for further study. This is an unusual feature in a small book, and adds greatly to its value. The danger is that these references will not be followed up by the average student, who will be satisfied with the outline of the subject, not realising that in the attempt to mention everything, nothing is fully described. For instance, in discussing syphilitic aortitis no mention is made of the destruction of the elastic tissue in the media; non-syphilitic aneurysms are attributed to arterio-sclerosis without any reference to medial degeneration; and mural vegetations are said to be as common in rheumatic as in malignant endocarditis. However, blemishes of this kind will not interfere with the usefulness of the book, provided it is used as it is obviously intended to be, only as an introduction to pathology.

Exercise, its Functions, Varieties, and Applications.

By Dr. ADOLPHE ABRAHAMS. London: William Heinemann, Ltd. 1930. Pp. 92. 3*s*. 6*d*.

A YEAR or two ago Dr. Abrahams collaborated with his brother in issuing a guide to training,[1] based on medical and physiological knowledge with a background of personal experience, for both brothers are distinguished track athletes. Within fewer than 200 pages they set out in non-technical language everything about training and competing which the athlete ought to know, and their views were wise and sound. Dr. Abrahams has now followed this up by a volume on exercises in a series of popular health manuals. There can be no criticism of the subject matter of this manual or of its manner of presentation, but one may perhaps be permitted to doubt whether the average Englishman will not be more amused than stimulated by the recital of so many generalities about exercise, a subject on which he is apt to consider himself at any rate his own personal authority. There is however one group of individuals to whom this book should supply a real need—namely, those with ever-increasing shortness of breath, stiff muscles, and rebellious livers, and who, in spite of repeated medical advice, are unable to face the problems of exercise. To these, unfamiliar with the technique of the embarrassingly large choice of activities they will find at their disposal, this manual should provide the necessary spur and fulfil the rôle of the carrot which has earned such a well-deserved reputation in the training of sluggards of a lower species.

[1] Training for Athletics. By H. M Abrahams and Dr. A. Abrahams, in collaboration with Lord Burghley, D. G. A. Lowe, F. R. Gaby, B. Howard Baker, and M. C. Nokes. London: George Bell and Sons. 1928. Pp. 189. 5*s*.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 14, 1931.

HEALTH PROPAGANDA.

SOME of the hygienic dovecotes of America were noticeably fluttered last summer by Dr. ROBERT HUTCHISON's speech at Winnipeg on The Pursuit of Health.[1] Not only did Dr. HUTCHISON condemn this pursuit as above all things unhealthy, but he suggested that its well-meaning promoters are actually damaging the community by their efforts to create a "health conscience." The old ignorance about the body and stolid resignation to its ills was probably, he said, a more "healthy" attitude, and certainly a happier one, than the modern curiosity and over-anxiety. A high standard of physique does not necessarily make people more efficient and alert, and the emphasis now being laid on physical welfare is, he thinks, detrimental to what is far more important—namely, character. We are now producing hypochondriasis—individual, vicarious, and national. Those who seek to save their health are losing it in imaginary ailments and crankiness and fear. Parents fuss over their children, and children over their parents. Health societies, health weeks, popular lectures and articles, booklets, leaflets, slogans, and even the legislature, all play their part in increasing sickness by suggestion. And most of their propaganda is based on fallacies—the fallacy that health is hard to attain and keep, and the fallacy that it can only be got by following rules. The way of health, as Sir THOMAS HORDER has put it, is too often regarded as a tight rope along which we make a slow and trepidating progress; whereas it is really a broad and well-paved road, and the wayfaring man must be a fool indeed if he errs therein. Only one health rule, said Dr. HUTCHISON, is universally applicable, and that is moderation—moderation in all things, even in being moderate.

These arguments, even in summary, are a challenge to an important section of our profession to show cause for its endeavours, and the challenger undoubtedly represents a large body of sane, if silent, opinion. In pointing out that health is only a means to an end, Dr. HUTCHISON and those who think with him would no doubt agree that physical fitness helps people to be sound in mind and temper, but they are vigorously reacting against a craze in which it has become self-conscious. So far, at least, so good. We should all admit that self-consciousness is as undesirable in personal hygiene as it is in personal virtue or learning. But is it not inevitable to a stage of transition? Are these objections to health teaching free from that obscurantist opposition which hinders every form of education because it sees the danger, rather than the promise, of a little knowledge? And is it true that medicine has nothing to offer the public beyond ST. PAUL'S counsel of temperance? Faced with the distresses of modern society, must we remain silent about fresh air, fresh food, and flies? Is there nothing to be said about breeding and pregnancy and infancy and childhood? Must we really leave the slums to their unconscious health for fear a little enlightenment may make them over-anxious? To questions of this kind most of us will answer, No. We will grant that young and old do well to learn a few of the elements of physiology; we will allow the missionaries of cleanliness to preach their gospel over dustbins and dejecta; we will even countenance a few cautious words about diet, provided there is no mention of vitamins. But we will draw the line, and firmly, at any emphasis on *disease*. Just as the churches nowadays concentrate on goodness rather than sin, we shall illuminate the sanitary rather than the seamy side of life, and thus avoid the worst of that hypochondriasis which is so evidently deplorable.

Is this a possible compromise? The ideal is to raise a generation capable of rational living and free from neurosis because it sees the abnormal in terms of the normal rather than vice versa. If every serious deviation from health could be brought at once to the doctor as a matter of course, there would be no need for potential sufferers to be told about their potential diseases. But how are people to know what symptoms are serious unless they are specifically told about them? If we are to spot disease in its earliest stages we must either encourage the public to bring every trifling ailment for our consideration, or we must spread alarming information about those pathological conditions that are most commonly disregarded until too late. Either policy creates or increases hypochondriasis on a very large scale, and Dr. HUTCHISON would have us eschew them both. Most diseases, he says, either cannot be detected early, or, if they are, little can be done to stop them unless one is prepared to give up for the sake of life, all that makes life worth living. That is Dr. HUTCHISON'S view, but it is inconsistent with the recurring cry for earlier diagnosis from physicians and surgeons, and gynæcologists. The chief case in point, which illustrates the others, is cancer. In a lecture we published on Jan. 3rd, Prof. BECKWITH WHITEHOUSE said:

> "We hear at times a certain amount of adverse criticism of cancer propaganda work and of the development of a state of cancerophobia in the middle-aged matron of to-day. Personally, I regard this as a healthy sign and a mark of progress. Without a certain amount of fear we shall not get women, especially of the uneducated classes, to submit themselves to the careful and detailed investigation necessary to ensure a correct diagnosis. . . . A very strong stimulus is necessary to make her seek advice. The only stimulus that we possess *is* cancerophobia, and for that reason I do not deprecate, I welcome it! Anyone, I am sure, would rather examine 100 women and cure their 'phobias' by proving there is no malignant disease present, than be in

[1] Canad. Med. Assoc. Jour., January, 1931, p. 16.

attendance during the last two or three months on some poor creature who thought that her symptoms were 'only due to the change.'"

Thus Prof. WHITEHOUSE, like Lord MOYNIHAN and many others, would make free use of fear as a weapon against the more physical disorders, and their arguments are certainly cogent enough. The British Empire Cancer Campaign, in its new handbook "The Truth about Cancer," is conspicuously unemotional and even reassuring; but its preface expresses a wish to spread an interest in cancer among those who are at present undisturbed about it. Almost everywhere in public health propaganda we find the same desire to shed an uncomfortable light among those that sit in darkness. "The public really are indifferent," writes Dr. JOHN MACMILLAN,[2] medical officer of health for Woolwich. "There is little evidence, except possibly in the case of the expectant mother, that healthy adults desire education in health matters." He goes on, however, to speak of the value of lectures:

"It is said that only the converted attend such lectures, but that is not my experience. Different lectures attract different types of audiences. A lecture on cancer attracts the middle-aged; a lecture on venereal disease the young. The tuberculosis audience is totally different from the psychological audience. A lecture on diet exercises a fascination for the dyspeptic, while one on sunshine attracts a representative but, unfortunately, less numerous audience than any of the others mentioned. It follows, therefore, that various sections of the community respond to different stimuli, and it may be that if we are persistent in developing such stimuli so as to attract all classes of the community, this subsidiary importance of lectures will be invaluable. . . . The present methods of stimulating interest are so few that none of them can be neglected."

In his enthusiasm for instruction, Dr. MACMILLAN almost seems an artist for art's sake, and the sight of his modern picture makes one thankful to look again at Dr. HUTCHISON's more sophisticated undertones. Each in its own way lends colour to Dr. WILLIAM BROWN's assertion (to a church congress last year) that the *idea of being ill* is nowadays being implanted in the public mind and so realising itself.

BACTERIOPHAGE IN INTESTINAL INFECTIONS.

FROM time to time we have reviewed reports on bacteriophage as a specific in the treatment of cholera and dysentery. Following upon the work of IGOR ASHESHOV and his colleagues, it has been established that for the satisfactory destruction of vibrios under field conditions a single strain of bacteriophage does not suffice, since certain individuals escape its action and give rise to resistant secondary cultures.[3] Polyvalency is therefore required, and this may be obtained by combining three types of anticholera bacteriophage which ASHESHOV has distinguished. These are mutually complementary and together can cause the total lysis and death of all the types of vibrio met with in clinical cholera. With this extended knowledge, and largely aided by grants from the Indian Medical Research Fund Association, investigation of the therapeutic value of the bacteriophage has continued, and recent reports[4] from Assam include some encouraging results. The practice at the King Edward VII. Memorial Pasteur Institute of Shillong, from which they emanate, has been to prepare a combined dysentery and cholera bacteriophage incorporating multiple strains of the lytic agent (including ASHESHOV's three cholera types) grown on at least five strains of cholera and six strains of dysentery bacilli. It has been found that preparations thus made are more stable than those prepared separately from individual strains of bacteriophage and subsequently mixed. Last year the institute issued 130,823 doses of its combined cholera-dysentery bacteriophage, and it has been extensively used in the treatment of dysentery in Assam tea gardens. By the issue of report sheets a praiseworthy effort has been made to obtain detailed accounts of the results which have followed its use, but here failure has been experienced, for only in about 7 per cent. of cases have reports been returned. From this meagre number we find that among 293 cases of acute dysentery there were eight deaths, and among 32 cases of the chronic disease, 17. These figures do not seem to be very favourable, but they cannot be assessed without knowledge of the current mortality of this disease—one in which the severity and mortality varies extremely from time to time and from place to place. Parallel series of cases, adequately controlled, are needed to establish the value of the procedure.

Details are given of localised outbreaks of cholera in a single village of 744 inhabitants. The disease appeared on Oct. 10th and by the night of the 17th had caused 71 cases with 51 deaths. At that time the bacteriophage became available and during the rest of the epidemic, which ended on the 28th, a majority of cases were treated orally by this means. In this period there were 72 further cases of the disease with 19 deaths. The patients who actually received the bacteriophage comprised 59 cases with seven deaths; so that between Oct. 18th and 28th the results may be summarised as follows:—

	Cases.	Deaths.
Treated by bacteriophage ..	59	7
Not treated by bacteriophage	13	12

These results may not actually be as demonstrative as they appear, since they are complicated by the fact that active cholera vaccination on an extensive scale was started on Oct. 22nd; but it is evident, from a scrutiny of the details of the report, that a somewhat dramatic change in the type of the disease took place on the 19th, and this was the day when bacteriophage therapy began in earnest.

These reports form a further contribution to the swelling mass of literature upon bacteriophage therapy, about whose exact value there is still no considerable common measure of agreement.

[2] Public Health, January, 1931, p. 147.
[3] See THE LANCET, 1930, ii., 1248.
[4] King Edward VII. Mem. Pasteur Inst. and Med. Research Inst., Shillong. Thirteenth Ann. Rep., 1930. Assam Govt. Press. Proc. Assam Branch Brit. Med. Assoc, 1930. Pub. by Indian Tea Assoc., Calcutta, 1930.

Cholera is likely to be one of the infections by which bacteriophage will stand or fall. The conditions in this disease are such that the organism should be an excellent substrate for the agent, if it is really capable of reproducing in the human intestine its test-tube effects, and reports of its use are therefore very welcome. At the same time nothing short of a rigidly controlled and statistically accurate investigation can give safe grounds for final conclusions. It should not be hard to carry out, but with a disease with the vagaries of cholera rigid impersonal control is an obvious necessity. This counsel of perfection seems as far as ever from realisation, although it is demanded with an almost tiresome reiteration. The defect may be as fully apparent to the field workers as it is to us, for we note that one of the reports under review concludes with the ingenuous remark that "we may have to await the use of the bacteriophage in the Army during a campaign to obtain statistically useful data."

INTRAVENOUS MEDICATION.

THE intravenous route of introduction of drugs has of recent years made great headway and may be said in certain instances to have justified itself very fully. Such examples as quinine in malaria, the arsenicals of the salvarsan group in syphilis framboesia and relapsing fever, tartar emetic in leishmaniasis, and emetine in amœbic dysentery will very generally be accepted as outstanding successes of this method. Its advantages are twofold, in so far as it enables the physician to administer drugs which cannot be introduced adequately by the alimentary route either by reason of toxicity or lack of absorption in an unaltered state, and secondly to obtain optimum concentration and distribution of the drugs introduced. The great measure of success in protozoal diseases has naturally raised hopes that the intravenous introduction of chemical bactericides may be the ultimate solution of the difficult problem of dealing with generalised bacterial infections. Experience has shown that this problem is one of considerable complexity. In the cases instanced above, where a measure of success has been achieved, we have been dealing with organisms which have acquired a high degree of what may be called specific parasitism. They are dependent for continued existence on a favourable host, and if deprived of that environment and subjected to unfavourable influences they are comparatively easily killed. The bacteria as a group have not reached that high degree of parasitism and can more readily carry on their existence apart from any host and in spite of adverse conditions both physical and chemical.

At a joint meeting held by the Sections of Surgery and Pathology of the Royal Society of Medicine (see p. 349), the intravenous use of germicides was discussed. It will be noted that a large degree of agreement was expressed from both sections as to the failure of the intravenous injection of chemical antiseptics in cases of bacteræmia. The experimental work detailed by Prof. ALEX. FLEMING was very generally accepted as conclusive and complete as regards test-tube conditions; the clinician, however, reserves the right to question the direct applicability of test-tube experiments to vital conditions. In such questions as these we should be unwise were we to ignore guidance from experimental methods in the laboratory, where some control can be obtained of factors likely to complicate the picture. When we come to decide how far such experimental results may be directly translated to vital conditions in man great caution must be observed. It must be admitted that even where the experimental work offers but little hope of success the clinical test must be the ultimate and final one. Unfortunately the evaluation of clinical results is often itself a matter of the greatest difficulty, as it is seldom possible to obtain strictly comparable controls; nor is it possible, as may sometimes be done experimentally, to check results by what may be termed triangulation, or experiments devised to approach the same problem from a different angle. In the discussion under consideration, as has been observed, there appeared to be considerable unanimity as to the failure of germicides to benefit in septicæmic cases. Prof. FLEMING'S experimental evidence would lead us to expect such failure, and it would appear that those experiments, controlled as they were by experiments demonstrating that blood in the test-tube kills off large numbers of bacteria when no antiseptics are present, may with some degree of certainty be taken as showing what may be expected to happen in the living body. The root of the problem was probably touched by Mr. T. H. C. BENIANS when he indicated that the real requirement was, not to kill the bacteria in the blood stream, as we know that the blood is itself able to deal very effectively with these up to considerable limits, but rather to deal with the source from which these bacteria are continuously (or discontinuously) reaching the blood stream. It would not appear likely that such a focus will be sterilised by any intravenous injection of chemical bactericides, but means must be sought by which the natural tissue reaction to infection may be encouraged to shut off such a focus, and further, the surgeon must be prepared to assist in its elimination by relieving pressure and by supplying drainage. The simplest example is, perhaps, in acute osteomyelitis, where before operation a growth is almost always obtainable in blood cultures, whereas a few hours after adequate opening of the focus of infection the blood stream usually will be found to be free from bacteria.

But while there is amongst surgeons and pathologists a large measure of agreement as to failure in the past, both groups retain hope that in the future intravenous medication may, in an indirect way, lead to more favourable results in these difficult cases. The striking results which are sometimes observed after the intravenous injection of hypertonic salt solution, or by the injection of substances which, for want of a better explanation, are said to produce "protein shock," give some

hope that a method of increasing the tissue reaction to infection may be found. Such a method may be discovered by the experimental method, but we must also remember that it may be reached by the empirical approach. Empiricism must be prepared to prove itself against severe testing and criticism. The experimental method carries its testing and criticism with it in a large measure, but it must ultimately be judged by its applicability to clinical conditions.

ANNOTATIONS

THIS YEAR'S INFLUENZA.

THE study of the evolution of disease, foreshadowed by Sydenham, is still in its infancy, but the syndrome known as influenza suggests a promising field of investigation. The name is retained for the sake of convenience, but every general practitioner of experience admits that he is dealing with a constantly changing disease. Some day it may be possible to assess the relative evolutionary importance of climatic and social factors, and the effect of cultivation through a succession of human hosts under varying conditions; at present we are content to take influenza as we find it year by year. Dr. Ulrich Friedemann,[1] Director of the Infectious Disease Wing of the Virchow Hospital in Berlin, says that the type he has seen among hospital patients this winter is almost exclusively catarrhal, many patients suffering from infection of the sinuses with suppuration. He has not yet observed the neuritic and gastro-intestinal forms though they are apt to appear in the later stages of an epidemic, and otitis media and pneumonia are also rare. A complication seldom observed before but common this year is, he says, catarrhal and follicular angina, and a certain number of patients suffer from cholecystitis with slight jaundice. Its appearance is preceded by eight days of catarrh and takes the form of a sudden feverish attack, generally accompanied by shivering, with a rise of temperature sometimes to 104° F. The characteristic pains of trunk and legs are not much in evidence this year, but headache is common and many patients suffer from severe herpes. The catarrhal symptoms chiefly consist of nasal catarrh, laryngitis, and tracheo-bronchitis, and the cough is often accompanied by pain. The fever disappears in one to three days but the convalescence is slow. There seems to be little distinction of age, except a predilection for infants. In Hamburg an epidemic is just dying down; it has been of a banal type with slight bronchitis and transient cyanosis, with a very low death-rate. Dr. Friedemann remarks that the ætiology is as obscure as ever, and that he does not think that this year's influenza is ætiologically identical with its forerunners.

Dr. Karl Schoenfeldt,[2] dealing with influenza in private practice, distinguishes between "influenza" due to Pfeiffer's bacillus alone and "grippe" due to Pfeiffer's bacillus in association with streptococci. Influenza patients, he says, show a moderate rise of temperature, pains of the limbs, and often respiratory symptoms, after some days of mild malaise. There is no great disturbance of general health and they recover quickly, although they may be troubled for some time afterwards by a cough or neuralgic pains. When, however, streptococci are present, the patient feels gravely ill and suffers from excruciating muscular and joint pains. The temperature is high, and the symptoms often include shivering, vomiting, diarrhœa, malaise, and severe headache, with a copious discharge of clear fluid from the nose. The lungs are generally free from symptoms. The temperature fluctuates considerably and may return to normal after two or three days, but relapses are common. Convalescence is prolonged and the patient may complain of complete physical and nervous prostration.

As Dr. Friedemann points out, the clinic practitioner and the private practitioner see very different types of cases, and doubtless the syndromes these two authorities describe will both be recognised in this country. The description of the involvement of the sinuses, for instance, tallies with the experience of several English practitioners this winter. Nevertheless it is quite possible that the term "influenza" is used to describe two or even more ætiologically distinct syndromes, and that until these are more clearly distinguished treatment must remain largely symptomatic.

[1] Med. Welt, Jan. 31st, 1931, p. 148.
[2] Ibid., p. 149.

HIGH SPINAL ANALGESIA.

THE principles and practice on which success depends, when attempts are made to procure insensibility of the upper parts of the body and the head and neck by injections into the subarachnoid space, were lucidly set forth by Mr. A. Dickson Wright before the Section of Anæsthetics of the Royal Society of Medicine on Feb. 6th. Success was illustrated by the appearance of a patient, aged 70, from whom a mass of malignant cervical glands had been removed a couple of weeks previously, the only anæsthetic used being an intrathecal injection. In this instance the injection had been made at a high level of the spinal cord, but generally Mr. Wright uses the lumbar interspaces. He employs novocain and believes that height of anæsthesia and the duration thereof depend on force of injection and amount of drug injected. His practice is similar to that which Koster in America has employed successfully on a large scale. The system admits of the use of spinal injection for anæsthesia in such operations as those for mastoid disease and for removal of tonsils. Mr. Wright claims that it is at least as safe as general anæsthesia, taking a view of results as a whole and including post-operative effects. The selective action of cocaine and its allied drugs for sensory as opposed to motor nerve-fibres is a basic fact on which the method rests, and Mr. Wright stated in evidence of this fact that experimentally the entire body can be rendered insensible by endothecal injection of cocaine without any motor paralysis being produced. The phrenic nerves are protected by this selective quality of novocain. As much as 18 grammes of novocain have been injected. It is not necessary to withdraw any cerebro-spinal fluid. The low blood pressure often evinced is not regarded by Mr. Wright as a danger, and he has seen the respirations fall to six per minute. When treatment for depressed circulation is necessary he believes in intravenous injection of adrenalin, and the post-operative headache which is only rarely troublesome he combats by injections of glucose or magnesium sulphate. Many speakers discussed the paper, and percaine, to which Mr. Wright had given but slight attention, was strongly advocated by Dr.

Howard Jones and Mr. Kirkby Thomas. Mr. C. Donald insisted on the importance of keeping the head low as the key to safety with spinal analgesia, and found little merit in either adrenalin or ephedrine. Dr. Z. Mennell uttered warnings against cisternal puncture, referring to instances in which it had been followed by death, apart from any injection of analgesic drugs.

HARVEIAN SOCIETY'S CENTENARY.

THE Harveian Society of London is now entering on the second half of its hundredth session, at the close of which the centenary celebration will be held. This will open with an oration to be delivered on Thursday, June 11th, by Dr. Raymond Crawfurd at St. Bartholomew's Hospital when Sir Thomas Horder will preside. To this meeting delegates will be invited from all the medical societies in London and surrounding districts; after the oration an exhibition of Harvey relics will be shown. On Friday the Buckston Browne Dinner will be held at the Grocers' Hall, with H.R.H. Prince Arthur of Connaught as the principal guest. On Saturday there will be a pilgrimage to Hempstead Church, Essex, where William Harvey is buried, the leaden shell having been transferred in 1883 at the instance of the Royal College of Physicians of London from a vault to a sarcophagus in the Harvey Chapel above it. Here a short service will be conducted at 12 noon by the Bishop of Colchester. On the return journey the pilgrims are to visit Rolls Park, Chigwell, where Harvey at one time lived, the present owner, Lady Lloyd, having offered to entertain any members and friends of the Society. After tea Sir D'Arcy Power will give a short address on Harvey's connexion with Rolls Park.

THE MISCALLED TUBERCULOUS KNEE.

ONLY a generation ago the diagnosis of tuberculosis of the knee was a much easier matter than it is now. Tumor albus genus was tuberculosis; that was that, and there was very little more to say about it. And water on the knee was chronic hydrops genus—an equally facile diagnosis on which to go to sleep. At a meeting of the Norwegian Surgical Association in Oslo last November, Dr. H. Sundt,[1] medical superintendent of the coast hospital at Stavern, showed how completely the attitude of the Scandinavian medical profession has been revolutionised in this matter during the last 15 years, and how we have not only learnt to eliminate from the category of tuberculosis some 50 per cent. of the cases which would almost automatically have been thus stamped a generation ago, but also how among the diseases now known to be non-tuberculous there is a large proportion to which no diagnostic tag can yet be attached. We have changed the self-complacency of ignorance into a questioning and diffident agnosticism. The wholesale manner in which chronic complaints of the knee were bundled into the tuberculous sack is well shown in a monograph on tuberculosis of the knee, published in 1889 in Oslo by Prof. H. Ström, whose material at the Rikshospital, collected during the 14-year period 1873–1887, consisted of 200 consecutive cases, all of which were labelled tuberculous simply on the strength of their clinical course and the naked-eye anatomical findings. During the 19 years Sundt has been in charge of the Stavern hospital (since Sept. 1st, 1911) 310 patients, suffering from some ailment of the knee, were admitted. In 205 cases tuberculosis was diagnosed. The ratio of tuberculous to non-tuberculous diseases of the knee was thus approximately as two to one. But during the last four years this ratio was further reduced to one to one, thanks to diagnostic advances in the forefront of which must be placed the exploratory arthrotomy.

Of the legitimacy of this procedure in obscure cases among adults Dr. Sundt is convinced. Even in the case of children the surgeon should not be as conservative in this matter as he was, for the exclusion of tuberculosis by an exploratory excision will save many from year-long conservative treatment for tuberculosis and from the social, economic, and mental injuries which this diagnosis inflicts. To show the part played by an exploratory arthrotomy at his hospital, Sundt has classified his material so as to group the patients admitted between Sept. 1st, 1911, and July 1st, 1919, in one lot. Only 14·7 per cent. of the patients in this first period were over the age of 15, whereas in the second period, from July 1st, 1919, to Sept. 1st, 1930, about 60 per cent. of the patients were above this age. Of the 109 patients in the first period, 83, or 76·1 per cent., were found to be tuberculous, whereas of the 201 admitted in the second period only 122, or 60·7 per cent., were found to be tuberculous. The main factor in this decline in the proportion of tuberculous cases was not, in Sundt's opinion, due to the increased proportion of adults among his patients, but to the diagnostic help given him by an exploratory arthrotomy. He performed this operation only 15 times in the first period, and in as many as 116 cases in the second period. This point is brought out even more clearly by a study of the last four years of the second period—i.e., from July 1st, 1926, to June 30th, 1930. Of the 95 patients admitted during these four years, only 48 were labelled tuberculous, the remaining 47 being considered as non-tuberculous. In as many as 61 of these 95 cases (56 adults and five children) the diagnosis was aided by an operation which in the case of all five children and in 25 of the adult cases led to the exclusion of the diagnosis of tuberculosis. Whilst the differential diagnosis was thus definitely clinched in every case operated on, it was possible to make a certain diagnosis, one way or the other, in only 10 of the 34 patients who were not operated on. Sundt speaks of the exploratory incision as a last resort; it is only because the differential diagnosis is so frequently difficult that the surgeon is driven so often to this last resort. For a tumor albus a small incision under local anæsthesia will suffice. But in the case of hydrops of the knee it may be necessary to take the risk of a complete exploratory examination of the joint.

The various other tests for tuberculosis are brought in review by Dr. Sundt and found wanting. The injection of fluid, aspirated from the knee, into guinea-pigs was undertaken in 37 cases, with positive results only in five. But among the 32 cases classed as negative by this test, there were eight in which a microscopic test (not further specified by Sundt) was carried out, and in six of these cases this test indicated tuberculosis. In two other cases the further course of the disease proved it to be tuberculous. As for the Pirquet test, Sundt quotes cases showing how even a definite focal reaction cannot be taken as irrefutable evidence of tuberculosis. Of the X rays he says that they yield no picture pathognomonic of tuberculosis of the joints. The rate of sedimentation of the erythrocytes is no specific phenomenon, nor can the complement-fixation test be relied on; in Sundt's experience it is much less reliable than the

[1] Tidsskrift for den Norske Laegeforening, Jan. 15th, 1931.

Pirquet test. With regard to the 105 cases which he classed as non-tuberculous, Sundt admits that in as many as 55 he could arrive at a no more definite diagnosis than non-tuberculous disease. The cases to which he could attach a more definite label included 21 of syphilitic disease and 11 of arthritis deformans. There were seven cases of osteomyelitis, three of hæmophilia, two of hysteria, and one each of giant-celled chondro-sarcoma, xantho-fibro-sarcoma, and chondro-pathia patellæ. Other surgeons have succeeded in naming a higher proportion of their non-tuberculous cases by the creation of a special class for cases of what they describe as "gonitis serosa." When such cases cannot be definitely labelled as tuberculous or syphilitic, Sundt adds them to his category "gonitis incertæ causæ." Most of the cases in this category in his material would probably come under the symptomatic term of "chronic synovitis" employed by Burckhardt. Poncet's tuberculous rheumatism, without microscopic changes in the knee characteristic of tuberculosis, may also be the correct diagnosis for some of these obscure cases which at present are a challenge to surgeon and pathologist.

MARRIAGE DISQUALIFICATION IN BIRMINGHAM.

A WEEK or two ago the public health committee of Birmingham, in advertising for a medical woman for its maternity and child welfare department, made it a condition of appointment that the post would automatically terminate on marriage. This action was, it seems, taken in pursuit of a general policy of reinstating the men who had been displaced by married women during the late war. Exception was taken to the condition by the local branch of the National Council of Women as well as by the Birmingham and District Medical Women's Association, and as a result of a combined deputation to the public health department the committee rescinded its decision, thus leaving it open for women medical officers to retain their posts after marriage. A similar situation, the outcome of which is still in doubt, has arisen at the General Hospital, whose board of management decided to reappoint a married officer, who had applied for four months' leave of absence because she was expecting a baby, but in future, save in exceptional circumstances, medical women on the staff of the hospital will be asked to vacate posts on marriage. The words "exceptional circumstances" were intended to cover not only home life but also peculiar fitness for the post in question. This action on the part of the board was contested at the annual meeting of governors last year but was upheld. The resolution, however, will not become operative until the meeting of the governors next month, when it is possible that it may not be ratified, especially in view of the city council's change in policy.

EARLY REFORMERS OF ASYLUMS.

Dr. H. J. Norman gave an interesting account [1] of the reformers who, at the end of the eighteenth century, introduced new methods of treatment of the insane. He spoke appreciatively of Dr. Semelaigne, a great grand nephew of Pinel, who had done so much to increase our knowledge of the events of that period. Referring to the work of Philippe Pinel (1745–1826), he outlined the famous story of the interview with Conthon at the Bicêtre, and the striking off the chains from the insane, and the subsequent reforms at the Salpêtrière. He spoke of Pinel as a simple, modest man, who had said that it was a happy allocation of circumstances which enabled him to carry through these reforms; nevertheless, his work was of supreme importance. Then came the foundation of the Retreat at York by William Tuke in 1792 and the publication of the History of the Retreat in 1812. Dr. Norman pointed out that the reform movement was sporadic and that it was not until the Lunacy Commission was established in 1845 that gross abuses were swept away. In their different ways Charlesworth, Gardiner Hill, and Conolly all contributed to this movement. It was, he said, Joseph Dacquin (1733–1815), who did away with the admittance of casual visitors who paid to see the lunatics, and wrote a book, now rare, on moral treatment. He declared that anyone who regarded the insane as a matter for amusement was a moral monster, and he denounced the practice of sacrificing good methods of treatment for economy. The first edition of Dacquin's book (1787) was dedicated to humanity, but the second edition was dedicated to Pinel, whom he regarded as "humanity personified." In the discussion which followed Dr. G. W. B. James gave some details of the routine of the patient's life at Moorcroft more than 100 years ago. They took country walks, stopping at inns for wine or beer, and smoking with churchwarden pipes. Dinner was taken at 4 P.M. and the diet was more than liberal, wine being abundant.

[1] Royal Society of Medicine, Sections of History of Medicine and Psychiatry, Combined Meeting, Feb. 4th.

EPSOM COLLEGE.

THE building of the School Sanatorium at Epsom College is progressing apace, and it is likely to be completed in July. This will enable the existing sanatorium to be transformed into an additional boarding house by next September term. Room will thus be available for another 25 boarders, which will lessen by that amount at any rate the number of applications for residence as boarders that have had to be declined recently. With this addition the number of boys at the College will be 450.

POISONING BY HYDROCYANIC GAS.

Hydrocyanic acid is widely employed in commercial processes, either in the form of the acid itself or as its sodium or potassium salt. On exposure to the air—whichever form is used—hydrocyanic acid gas is given off, and it is therefore important to know at what concentration this gas becomes dangerous to human life. Owing to the rapidity with which death may follow its inhalation there are limitations on experiments upon human beings, but something has been learnt from a series of observations on animals lately made by Prof. Joseph Barcroft at the War Office Experimental Station.[1] Apart from any idiosyncrasy in the animal, it was realised that two factors would affect the toxicity of the gas: first its concentration in the atmosphere, and secondly the duration of its application. It was found that this relationship was not a simple one, for when the concentration of the poison was sufficiently low, the animal could be exposed to it indefinitely without apparent harm. It was hoped that by making enough experiments deductions might be formed which were applicable to human beings. The size of the animal was found to be no criterion of its ability to survive. With the toxin at a lethal

[1] Jour. Hyg., January, 1931, p. 1.

concentration dogs died before cats, rabbits earlier than rats, and all these expired before goats and monkeys. It is difficult to understand why there should be this difference in the time factor between these various animals, but a suggestive experiment upon a cat and a rabbit is quoted. H. Taylor exposed these animals separately to atmospheres containing HCN, under such conditions that the respiratory exchange could be measured. Although the initial ventilation-rate was the same in both animals, the introduction of HCN into the air had the effect of increasing this rate in the cat, and of diminishing it in the rabbit. The net result was that although the rabbit, as it so happened, was in an atmosphere richer in HCN than that in which the cat was placed death was longer in its onset in the former than in the latter. When, however, the total amount of HCN inhaled by each animal was calculated, it was found to be the same for both. As these animals were of the same order as regards size, it may be assumed that if there were no destruction of the poison in their tissues, then the concentration of HCN would be the same in the blood of both animals when death occurred, and this concentration would be an expression of the lethal dose. The toxicity of the poison is due to its paralysing effect upon intercellular oxydases, and the respiratory centre is the earliest of the vital tissues to succumb. Canaries and pigeons are much more susceptible than rats and mice.

Discussing the practicability of applying the results of these experiments to man, Prof. Barcroft quotes an actual experiment where "a man" and a dog were both enclosed in an airtight chamber, the atmosphere of which contained HCN at a concentration of about 1 part in 1800. The dog became unconscious in one and a half minutes, whilst the man felt no symptoms. During the course of this experiment any movement made by the dog up to the time of unconsciousness was imitated by the man, so that increased respiration due to muscular activity would be to a comparable extent in both. The dog therefore seems to be more susceptible than man. It is known, however, that mice and canaries are more easily killed than the dog, and for this reason the mouse is sometimes used for testing the toxicity of an atmosphere. Here, however, a fallacy may arise, incidental to the manner in which the test is executed. When the observer, as is usual, carries the animal into a suspected atmosphere he is performing work, whereas the mouse may be at rest; and as a consequence its relative sensitiveness is diminished. Where the concentration of the gas is low (0·1 mg. per litre) the best indicators are birds. A man could breath this atmosphere for ten minutes without harm, whereas a canary would be dead in two minutes. Precautions must be taken by the observer, however, not to exert himself unduly. He should be breathing normally. Of the quadrupeds, the dog is the most sensitive, and as the animal would be walking alongside the observer, it would thus be performing a comparable amount of work, with its consequent effect upon the rate of breathing.

The question of treatment of poisoning by HCN inhalation is also considered. Several methods have been proposed, including artificial respiration and injection of glucose. The administration of glucose has been suggested for the treatment of poisoning by cyanide; but in these experiments it was shown that glucose has no protective action against poisoning by the inhalation of HCN. In view of the fact that the heart may go on beating for some time after respiration has ceased, the greatest hope for recovery seems to lie in artificial respiration. It must be realised that it is a race between the destruction and the dissipation of the HCN on the one hand and the permanent degradation of the machinery of the body on the other. Artificial ventilation of the lungs will assist in dissipation of the HCN; and if oxygen be used instead of air, it seems natural to assume that the destruction of the toxin will be hastened.

A DEFENCE OF MENTALISM.

THE late Prof. Rignano did not live to see his last defence of Mentalism translated into English,[1] but in the last year of his life he was able to conduct a lively controversy with the materialistic biologists. Like the best philosophers, he was too wise to reject the diverse facts of nature on the one hand, or the encroachment of mechanistic physics on the other. He has tried to bring about a compromise by positing a new type of energy which will satisfy the "vitalistic" needs of the organism without running head first against the barrier of physical science. Although he cannot see his way to abandoning Purpose and Teleology as interpretations of life, he finds that he cannot altogether put aside those laws of physics which must govern the changes in matter, whether living or otherwise. He takes refuge in the concept of the labile characteristic of all vital equilibria. Metabolism is itself "the chemistry of becoming" rather than that of static constitution. Biologists say that Rignano sees more teleology in living things than they actually possess. Those biochemists who are concerned with the peculiarities of colloidal equilibria, will not need a new principle to explain the labile states of their materials, which are so akin to living protoplasm. The Donnan equilibrium, for example, shows how very near present-day colloidal chemistry is to explaining the dynamics of life without reference to any special energic principle. Prof. Rignano made an honest attempt to save biology from the neo-mysticism of Bergson and Driesch, and also to save it from complete mechanisation. For that alone, and for the authors scientific approach and consideration of all levels of biological action, the work deserves the attention of all thinking biologists and physiologists.

GASTRIC SYPHILIS.

MANY authorities, including Clifford Allbutt, have held that syphilis of the alimentary tract is very rare, except perhaps in the mouth and rectum. On the other hand, most observers with special knowledge of diseases of the abdomen become aware that cancer of the stomach may be closely mimicked by syphilitic disease; indeed, it has been stated that the only chance for a patient suffering from cancer of the stomach is the possibility that the diagnosis has been at fault in this respect. Gastric syphilis has thus an occasional importance, and Dr. G. B. Eusterman's[2] observations on 93 cases at the Mayo Clinic will be read with interest. In four of them the infection was congenital, and in all but 28 the diagnosis was established before operation, chiefly by X ray examination and serological tests. The symptoms were usually of long standing and progressively severe, including as a rule pain or discomfort immediately after food and severe enough to have caused emaciation by the time the patients came under observation. Vomiting and pain were prominent, but, in contrast with cases of carcinoma, nausea and

[1] The Nature of Life. By Eugenio Rignano, Professor of Philosophy, University of Milan. London: Kegan Paul and Co. International Library of Psychology, 1930. Pp. 168. 7s. 6d.
[2] Eusterman, G. B.: Jour. Amer. Med. Assoc., Jan. 17th, p. 173.

anorexia were usually either absent or little in evidence. In a small proportion of the cases the onset of symptoms was even more insidious, and the pain was so slight compared with the signs of undernutrition that the diagnosis from cancer was more difficult. In a third group ulceration was the most prominent event, and here the symptoms—relief of pain after eating and onset of pain at a period remote from meals—was such as to make diagnosis of peptic ulcer probable. Hæmorrhage was extremely rare, for the whole series yielded only five authentic instances of bleeding, and in several of these there was cirrhosis of the liver. Anæmia was also inconspicuous and was in no case marked. In gastric syphilis a palpable tumour in the abdomen is comparatively seldom found, and if carcinoma is suspected it is more because of the resemblance between gastric syphilis and linitis plastica than because of any close resemblance of syphilis to more usual types of gastric cancer. Eusterman finds that gastric analysis did not afford much assistance in the diagnosis. There was complete achlorhydria in 80 per cent. of the cases, and the stigmata were different from carcinoma in that pyloric obstruction was not usually present. Radiographic examination reveals evidence of a circumscribed or diffuse involvement of the gastric wall rather than a growth protruding into the lumen; thus, peristalsis is notably interfered with, but filling defects and pyloric obstruction are usually absent. It will be noted that none of these signs is pathognomonic, and it is the positive Wassermann reaction, probably with a history of syphilis, which really makes the diagnosis possible. The therapeutic results cannot be called more than fair; rather over a third of Eusterman's series are classified as cured, and nearly half as "much improved," but the remainder were unsatisfactory. Syphilis, gastric cancer, and gastric ulcer are all common diseases and the simultaneous occurrence of syphilis and cancer is always a possibility. But since one disease is necessarily fatal, and the other is often curable, it is worth while to examine the blood whenever gastric cancer is suspected.

THE NEW PERIMETRY.

THE importance of perimetry is at least as great to the neurologist as to the ophthalmic surgeon. The latter is chiefly concerned with the mapping out of the visual fields in such diseases as glaucoma, retinal and choroidal affections, and the different forms of optic atrophy and retro-ocular neuritis. He is also concerned with the various forms of limitation of the field which are connected with affections of the occipital lobe and of the visual fibres in their course between the cortex and the optic chiasma; but these cases are primarily neurological. In the past it was considered enough to test the fields of vision with an ordinary mechanical perimeter such as MacHardy's, and this is still the most generally used instrument for ordinary cases. For accurate work in the central part of the field, enlargements of the blind spot and so forth, various forms of scotometer have been in use for many years. These depict the central field on a larger scale, the test object being moved by the surgeon's hand.

A work in perimetry by Mr. Traquair, which has already won for itself the place of a standard work on its subject, has now reached us in its second edition.[1] A large part of this work deals with hemianopic and quadrantic defects depending upon supranuclear and suprachiasmal affections, and is liberally illustrated by charts. Mr. Traquair lays great stress on relative defects in the visual field and compares the normal field to an island of vision surrounded by a sea of darkness, the central part of the island being elevated into a conical hill with steep sides. Any abnormal depression in any part of this hill can be demonstrated by using test objects of varying diameters, each diameter corresponding to a contour line which is normal for that size of test object but which in abnormal states may vary. In this way the new perimetry is concerned not only with qualitative defects of the field of vision but with quantitative ones. That the importance of the subject is realised appears from the comparatively short time which has elapsed since the appearance of the first edition of this work in 1927. Its value is likely to receive still further recognition.

[1] An Introduction to Clinical Perimetry. Second edition. By H. M. Traquair, M.D., F.R.C.S. Edin., Ophthalmic Surgeon, Royal Infirmary, Edinburgh. London: Henry Kimpton. 1931. Pp. 281. 30s.

HEALTH SERVICES IN LIMERICK.

THE Department of Local Government and Public Health, writes our Dublin correspondent, is meeting considerable difficulty in carrying out its determination to have whole-time medical officers of health appointed for the several counties and county boroughs. The latest obstacle is the corporation of the city of Limerick. The department has written to the corporation calling on them to fix a salary for a whole-time medical officer of health at a figure not less than £800 a year. It was pointed out that there was in Limerick an abnormally high infant mortality and the highest maternal mortality in the State. The department added that the terrible wastage of life could not be defended, and that there was pressing and urgent need for reorganising the public health services of the city. The attitude of some of the members of the corporation was illustrated by a remark from one of them that the duties had been admirably discharged hitherto for a salary of £175 a year. After discussion the corporation appointed a committee to discuss the public health services of the city with an inspector of the Department of Local Government and Public Health.

COMMISSIONERS OF THE BOARD OF CONTROL.

UNDER Section 11 of the Mental Treatment Act, 1930, the Board of Control, with the approval of the Minister of Health, have appointed the following to be Commissioners: Dr. A. E. Evans, Dr S. E. Gill, Dr. E. O. Lewis, Dr. J. W. W. Adamson, Surgeon Rear-Admiral J. F. Hall, and Surgeon Rear-Admiral E. T. Meagher. All these are at present medical inspectors. The Board have also appointed as Commissioners Mr. C. F. Penton, barrister-at-law, Miss I. M. C. Duncan, barrister-at-law, Surgeon Captain H. C. Devas, Dr. I. G. H. Wilson, and Miss R. Darwin (part-time).

BRITISH HOSPITAL IN PARIS.—On Thursday last week the Duke of Atholl opened the new maternity wards at the Hertford British Hospital in Paris. The new building, which will accommodate 12 patients, includes an isolation room and a nursery. Last year 100 babies were born in the hospital, which now provides for the needs of English residents not only in Paris, where they number 30,000, but of almost all the north and north-west of France.

A POST-GRADUATE COURSE

MOTIVES AND MECHANISMS OF THE MIND.*

VII.—LOVE: THE RÔLE OF THE MOTHER.

MOTHER IMAGO.

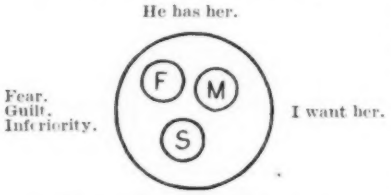
THE preceding lecture dealt with the idea of "father imago" and the importance of the feelings, rationalised opinions and projection images derived from it. It is now necessary to consider the closely related conception of "mother imago." Although for the sake of convenience father imago and mother imago have been divided, it will be seen that they are in fact mutually interdependent, the feelings about the one being closely associated with complimentary feelings with regard to the other.

The origin of mother imago is the same as that of father imago. It is an inborn feeling pattern with regard to the mother-figure, derived from past racial experience. In the same way that father imago is more than father, so mother imago is more than mother. The feelings are present originally as an inborn *potentiality* and become modified by experience of mother, mother-surrogate, and mother-similars. We shall again confine our attention during this chapter to the imago reactions of the male for reasons of convenience and simplicity.

The inborn primary affect of the son for the mother is "I want her, I want her to love me." The way in which this love and longing for the mother clashes with feelings associated with the father imago—namely, those of inferiority, guilt, and fear of punishment, was discussed in the previous lecture. The problem then is the following: "How is it going to be possible for me to possess my mother for myself without conflict with father imago?" It is suggested that the answer to this fundamental problem is provided by a very large number of psychological disorders. In general it may be solved in one of the following ways:—

FIG. 1.

"Feelings about" Mother Imago:—



Encircled letters = F, feeling about father; M, feeling about mother; S, feeling about self.

(A) Normal emotional development.
(B) Fixation compromise.
(C) Total repression.
(D) Messianic compensation.

(A) NORMAL EMOTIONAL DEVELOPMENT.

This has already been dealt with in Lecture V., in which was pointed out the way modification of the mother-figure occurs through a series of associated similars, such as nurse, aunt, sister, cousin, and mother-substitutes.

We are now able to realise something of that normal but often chaotic process of *falling in love*. Love does not begin with adolescence, nor with the first girl after that period to whom we lose our hearts. Love begins with the mother and all love thereafter is a modification of love for the mother. It is obvious what a complete change there must be, since the sexual component must be *kept absent* with regard to the mother, but must be *dominant* with regard to the mate. This psychological development must occur before a man can be physiologically potent.

At puberty the physiological development of the gonads introduces a more or less sudden factor of sexual dominance. The main continuity of development, however, is still in the line of transferred affect, from individual to individual, of the mother-mate series. It is as if there were in the beginning a sensitised plate containing certain hidden potentialities, the detail of which has been brought out, little by little, by successive experiences of loved ones. The earliest and therefore deepest impression results from experience of the mother. But this gradually becomes modified by successive experiences of mother-substitutes. The love image carried within the individual is in the first place the primary object of his love, and the external loved one is no more than an external reference or reflection of this inward image.

When a person falls in love he has found the external reality who appears to correspond more or less with his internal love image. It is as if he has superimposed his love image upon someone, but she may in fact be quite different from it. If the love image is still emotionally immature, it will contain much of the mother-figure, and the loved one will in all probability be older and more experienced than himself ("calf-love"). In this case there is very likely to be an absence, due to repression, of the sexual factor, because of the fundamental importance of dissociating sex from the mother-figure. If the girl is his own age or a little younger, further modification and growth has taken place and the sexual element is likely to be more dominant. The crisis and chaos of falling in love is due to the conflict of the new experience with the old, the difference between love for the mate with all its sexual dominance, and love for the mother with its inevitable sexual repression.

One of three things may occur. It must be remembered that the individual has not fallen in love so far with any real person, but only with his own love image. He may therefore try to modify the external person to correspond with the details of his love image. This is liable to be disastrous, because the girl only feels that she is being criticised and, worst of all, that she is being criticised in favour of her mother-in-law to be, whom she unconsciously and quite truly feels to be her rival. Even a slight hint of criticism may cause a violent reaction, such as the suggestion, "My mother would not like it if . . . ." or "The way my mother cooked was different." The man may be so devoted to his mother love-image that he cannot tolerate the reality of his loved one, whereas she cannot tolerate the comparison with her mother-in-law. This situation, whether it occurs before or after marriage, spells failure.

The second possibility is that the man will, after a little experience of his loved one, find that after all he has made a mistake, because she is not the person that he thought she was. It is as if the projected love image is no longer applied to her and she is now herself, unloved instead of invested with the love

* A course of 12 lectures delivered under the auspices of the Tavistock Clinic, Tavistock-square, by Dr. E. Graham Howe during the autumn session of 1930. Earlier lectures of the series have appeared weekly in THE LANCET since Jan. 3rd.

image. He is no longer in love with her and wonders, in all probability, why he ever thought he was.

The third alternative is the only one which can lead to mutual happiness. In the beginning, when he first falls in love, the man is in love with his love image rather than with the girl upon whom he has attached it. A modification takes place of the image towards reality, until it finally coincides with the real personality of the loved one. Love image and loved one are now one and the same, and if this has at the same time taken place with regard to the girl's love image for him, they can be said to be at last truly in love with each other. But it must be realised that this is, as a general rule, a matter of prolonged experience and emotional development on both sides. Many people are inclined to think that when they fall in love they have at last achieved a long looked-for end. But this is not true, they are so far only at the beginning, because so much mutual modification and growth remains to be done. It is a very easy thing to fall in love. It is much more difficult to be in love with the real truth of the loved one. If lovers realised that falling in love was the beginning, love would not end so soon as it often does.

(B) FIXATION COMPROMISE.

The second method of obtaining fulfilment of the wish to love and be loved by the loved one is called *fixation compromise*. It is partly a fixation and partly a compromise: "I want my mother, but it must be without guilt or fear." Can this be done? If so, it is quite certain that a great many will succeed in doing it. The simplest way in which it can be done is by *idealisation* of the mother, the sexual component in her womanhood being entirely eliminated, because it is the primary source of both guilt and fear. She must be perfect, pure, virginal, immaculate, and she must be mine, without any suggestion of rivalry or competition for her love. Also, in order to complete the picture of wish-fulfilment, she must love me as I wish to be loved.

This idealisation of the mother-figure takes place as a modification in phantasy of the mother imago, which then becomes attached to some suitable external objective, real or imaginary, which is loved with the deepest—but quite asexual—emotional regard.

It is interesting, therefore, to note that the Virgin Mary figure, who so fully satisfies all these requirements, is not peculiar to the Christian religion. In many others the Virgin Birth and the idealised and de-sexualised mother-figure is introduced. It is as if, the world over, the same wish-feeling in men has striven unconsciously to possess for themselves the mother-figure without guilt. The immaculate Virgin conceives without human impregnation and the father is thereby eliminated, at the same time that the sexual factor with its association of guilt is also spared. The Virgin Mary is the idealised and de-sexualised mother, with the deepest unconscious emotional appeal. The maternal aspect of religion seems to be an essential factor. It is as if, although father imago is the main source from which the conception of God is derived, the mother imago is an essential component also of the divinity, as a corrective to that stern and patriarchal figure.

It is possible, however, to carry this process of idealisation and de-sexualisation of the desired mother-figure yet a stage further in the escape from fear and guilt. She can be more than *de-sexualised*, she can be *de-materialised*, and thus placed altogether beyond physical form and feeling. Is there any evidence that such a process has been at least partly responsible for the unconscious formulation of our ideas of God? There are certain facts of clinical psychopathology which suggest that there is this unconscious motive in the conception of the Holy Ghost, which was referred to in mediæval literature as "she" and "the mother."

It is a matter of frequent experience that patients possessed of an intense feeling of guilt, as in melancholia, often say that they have committed the sin against the Holy Ghost, the "unpardonable sin." The evidence which they are able to adduce may seem very small to us, being frequently associated with nothing more uncommon than masturbation. But it sometimes happens that boys for whom masturbation is a "secret vice," and who have only heard a passing reference in church to the "unpardonable sin," will feel that they are utterly condemned because they have committed it. The unconscious mechanisms of psychology are not interested in modern religious criticism, but they strike deep through the superficial form to the underlying origins of religious belief, where the doctor, who wishes to understand his patients' disorders, must be prepared to follow, even at the expense of a strain upon his own prejudices. We must accept all our patients' "lunatic" statements as being *perfectly true for themselves and under their circumstances*, which is not at all to say that they need to be true for us. But we cannot convince them of what we wish, until we first know *why* they believe what they do. If we approach the statements analytically, which is easy enough, and without personal prejudice, which is very difficult, we can find the key to all that seems so illogical and unreasonable. The only difficulty which finally needs to be overcome for our complete understanding of it is the *extreme simplicity* of the material with which we are dealing. *Psychopathology is only difficult to understand because of its extreme simplicity.*

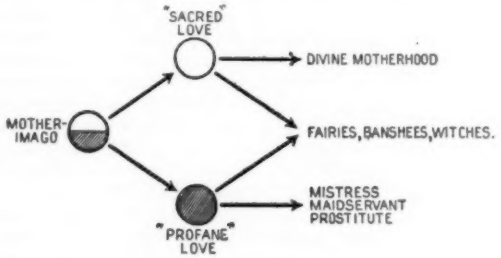
It is suggested therefore that the "sin against the Holy Ghost" is derived from the guilt of the original incest motive, and is closely linked with what has already been said of the psychology of masturbation, with its associated mother-fixation. Although the concepts of the Virgin Mother and the Holy Ghost have been developed as a means of escape from the guilt feeling, while at the same time fulfilling the wish for the mother, it is plain that the device is far from being always successful.

SACRED AND PROFANE LOVE.

In the same way that the father imago was split into "good" and "evil" types, mother imago is also split into "good" and "evil." The Virgin Mother, idealised and de-sexualised, is the type of what is spoken of as "sacred love," in opposition to "profane love." *Sacred and profane love represent the two derivatives of split mother imago* (Fig. 2). Sacred love, in itself an escape from the burden of guilt, is also an escape from the biological sexual factor, which still remains, urgent and obsessive, to be accounted for and satisfied. This can only be achieved by what is left after the idealised part has been removed. What remains still clamouring to be satisfied is a crude, physical, and sexual factor, without the check of virtue and the ideal. The loved object tends to be both despised and degraded, and to conform to the prostitute type. Very frequently it is found that the only son, or the mother-fixed son, is strongly addicted to masturbation, and later to attraction by women of the lower classes. He is filling in a supplementary detail of his love for his mother by a *dissociation*. On the one hand is sacred love, of which the idealised mother-figure remains the

object; on the other, profane, attraction being felt towards a woman of a lower class and crudely sexual type. The servant girl, also, possesses an added attraction to those with dissociated mother imago feelings, owing to the fact that she is inferior and may be both possessed and despised. The cause for her being despised is the craving on the part of the man for *superiority* comparable to that

FIG. 2.—*The Split Mother Imago.*



with which father imago is endowed. He must feel superior, and in order to feel superior in his possession of the woman he chooses an inferior woman as his sexually desired object. Further, there is also the need to evade responsibility as far as possible. Mother fixation psychology is a *dependent* psychology, immature and lacking in self-reliance. Mother fixation evades responsibility and finds satisfaction where most can be obtained and least given.

It is important to realise the extent to which the usual idea of immorality coincides, although for different reasons, with psychological values. In general, psychology agrees with the more or less unreasoned judgment of conventional moral standards, and does not condone that complete freedom from sexual restraint, which is frequently claimed for it by enthusiastic but usually amateur supporters.

There are female figures also created by the imagination, like the giants and ogres derived from father imago. These are the fairies, furies, witches, and banshees of fairy-tale and mythology, sometimes good, sometimes evil, and loved or feared accordingly.

It is not the purpose of this lecture to present a psychological criticism of religion, but the subject is of great importance in psychopathology, and so much has already been said about the conception of God derived from father imago and mother imago that it might be useful at this point to say a little more. The mother element cannot be left out of religion. If she is not projected into the Virgin Mary, she is present in the Holy Ghost. But this figure is too vague to give much emotional satisfaction. The mother-figure then tends to be applied to and confused with father imago, giving rise to a sentimentalised version of the Deity, with a strong maternal and feminine component. The mother-element is again very liable to be introduced into the third member of the Trinity—namely, the figure of Jesus Christ. Primarily, as of subjective psychological importance, He is the compensatory figure for personal guilt. He is the perfect man, guilt-free and sex-free, and the mediator between guilty man and the omnipotent punitive father. However, again the mother imago affects tend to confuse the Christ figure, introducing a quality of effeminacy and sentimentality into his character, which is essentially foreign to it.

All that has been said is not intended to refer in the slightest degree to matters of objective, historical validity, but only to the *unconscious factors* of the subjective psychological approach to what may have its own objective validity. To say that father imago and mother imago are factors in our conception of the Deity is merely to state a platitude—namely, that our feelings about God do not correspond necessarily with the objective truth of His reality. What *we feel* about God is a psychological matter due to psychological factors. The *objective validity* of God is altogether a different matter, but it would seem to be essential to know first of all why we feel as we do about God, before we try to discover what objective validity there may be. Unless we can do so we look not at objective reality, but into a mirror in which we shall see only the reflection of ourselves, our feelings, and our wishes. To look in this mirror and to interpret what we see is the function of psychology, but all that can definitely be said is that what we see there is probably not God.

(C) REPRESSION.

The third method of dealing with the problem of obtaining the desired loved object, without the conflict engendered by guilt, is that of *emotional repression*. Repression is obtained by one of two mechanisms; either a complete negativism in which feelings are repressed altogether, or by a defensive over-compensation in which the character of the original affect is replaced by the opposite. In the first case the statement, "I love my mother" is replaced by the statement, "I have no feelings whatever." Frigidity and freedom from the dangerous course of love solves the problem of guilt, if it does not provide fulfilment of desire. It is a state of negativism, of nothingness, but as a rule wish-fulfilment seeks its goal through some other channel. Negativism simply has no use for women, but, as in the case of the normal adolescent phase of homosexuality, wish-fulfilment finds its way by some other means to the original goal, after it has undergone certain necessary modification and disguise.

Pseudo-intellectualism frequently accompanies emotional negativism, as being the source through which wish-fulfilment can be at least partly obtained. Such false intellectualism maintains *distance* and *safety*. Women are approached on a "high-brow" or intellectual plane and contact is distantly through speech. It is probable that much that has been written and much that has been said would never have seen the light of day had there not been emotional repression behind it. Talkative people are not usually psychologically stable. People who feel keenly and behave actively in tune with their feelings have not, as a rule, got much to talk about. The high-brow is typically neither creative nor emotional. He is rather a fraud, who finds safety from the fire of feeling in the smoke of words. In his psychopathology he is fleeing from fear, guilt, and inferiority, posing as superior because he is afraid to be what he is.

Negativism alone is not usually sufficient to preserve emotional repression. Perhaps the safest of all methods of escaping from guilt is by means of *reversing* the affect from love to hate. This is a simple unconscious mechanism which is the origin of the phrase: "Hell knoweth no fury like a woman scorned." To love and to be scorned is intolerable, and only by a transposition to the reversed affect of hate can the situation be stabilised. Similarly, to love without any possibility of love being requited without intolerable guilt is impossible, and the situation can only be stabilised by the introduction of a reversed affect. "I love my mother" therefore

becomes "I hate her." It is a sign of a repressed mother fixation, which makes it so difficult for a patient to realise what his true underlying feelings are, when he says: "I cannot bear my mother to kiss me. I never kiss her good-night. I do not even like to touch her. I hate all women." Such a misogynist is suffering from repressed mother fixation. He hates all women because he loves his mother, and therefore he must hate her too. It is possible that in some earlier emotional experience he was jilted with intolerable suffering to himself. His hatred of women is again defensive, but it provides security at the expense of frustrated wish-fulfilment, and he must remain an embittered and disappointed man. Emotional repression is always the cause of subjective embitterment. The acidulated spinster is more than frustrated and disappointed, she is also retaliating against life for having robbed her of the gratification of her greatest wish.

(D) MESSIANIC COMPENSATION.

A feeling of guilt is intolerable and requires unconscious and mechanical relief. "If I feel very bad, what I need is to feel very good—to feel not only very good, but the best of all possible." This is again an example of a reversed affect in which primary black becomes secondary white. The psychology of the *prig* is that of "Messianic compensation" for an underlying feeling of guilt. He is a person who never does anything wrong, but is always seeing wrong in others. In two ways he evades his own intolerable guilt feeling—by looking white himself, and seeing only black in others.

Priggishness shows itself sometimes as one of the signs of adolescent "green-sickness." Adolescence is the period at which there is a normal increase of sexual feeling and therefore a normal increase in guilt feeling. It is therefore the time at which priggishness is most liable to be needed psychologically as an evasion of guilt. Adolescence is a time of vivid imagination and great ambition, seeking enemies to slay and new fields to conquer. It is a time when knights pursue the vision of the Holy Grail and seek opportunity for the rescue of fair and embarrassed ladies, but it is also a time of guilt and green-sickness, of priggishness and conceit. The adolescent knight is often more interested in the gorgeousness of his armour and the purity of his motive, than in the distant goal of the Holy Grail and the imperilled lady. It is therefore perhaps unfortunate that this should be the time that is usually chosen for seizing upon a boy's religious enthusiasm, which is too often mixed with unconscious motives, with a view to confirmation. The safest motto for adolescence is "It is better to *become* good than to *be* good." Confirmation at this phase of rapid growth and emotional instability will too often lead to undesirable repressions, or to a later regret and refusal of religious experience.

The Wrong Kind of Mother.

The three cardinal psychological errors are fear, guilt, and inferiority, and the wrong kind of mother is she who stimulates any one of these. It is the fault of the father chiefly to stimulate the last, although there are mothers who succeed in doing so. The easiest fault for the mother to exaggerate is *fear*. She loves the child so much that she tries to protect him and make life always easy and happy. There are mothers who with the best possible conscious motives say: "I only want my children to be happy." The child cries and is comforted or given what he wants. He is told by an adoring parent that he is the most wonderful child that ever lived. But however sure the fond mother may be to the contrary, the motive is not unselfish, being due to undifferentiated ego. "My child is me. I praise my child, I praise myself." Such an attitude, however well-intentioned, is pregnant with disaster for the child.

Many mothers are over-disposed towards cotton-wool and sentimentalising. Their zeal for protection is obsessed with fear of all the multiplicity of life's dangers. Of all life's dangers probably the greatest is cotton-wool. The chest which is kept padded by cotton-wool against fresh air is most liable to be attacked by the first virulent germ which comes in contact with its over-sensitised mucous membrane. The individual who is kept padded with cotton-wool falls the easiest victim to every danger and difficult circumstance. The mother who is afraid herself encourages fear in her children, and where fear is love cannot thrive, nor progress make its way.

All mothers want their children to be good. This is largely a matter of domestic economics and comfort, but it is very easy to expect children to be too good. Again the danger is of causing repression and making prigs of them. The mother is often the last person suited to deal with the child's deepest moral problems, because she is already the cause and centre of his deepest guilt feelings. Only if the child is free from guilt can he be expected to be emotionally coöperative with his mother, and only if he is free from fear can he be the same with regard to his father.

Motherhood is too often the source of unnecessary disappointment and tragedy. Conscious intentions may be so good, and yet the psychological consequences may be so dangerous, owing to ignorance of the elementary psychology of unconscious motives. Mothers must learn to regard their function as limited, their opportunities as fleeting, and their task truly unselfish, and its own reward. It is no use trying to prevent the child from growing beyond their care. It is no use trying to protect the child from his own urge towards living more abundantly. It is no use to sacrifice the present and the future for a sentimental attachment to past joys. At the right time there is much that the mother can do, but when that time is past, it is best left alone, rather than attempts made to live the past again.

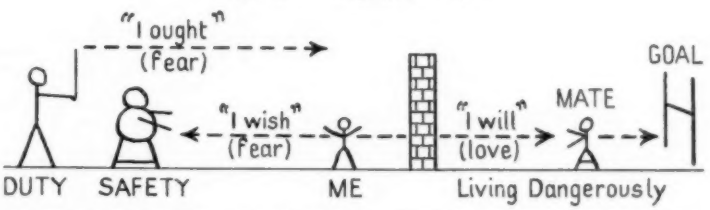
A patient of 18, whose history clearly showed him to be in danger of developing dementia præcox, was prevented from entering a nursing home for early treatment because his mother wrote saying that she felt she loved him and knew him so much better than anyone else, and she felt sure that she could better take care of him!

The Right Kind of Mother.

The right kind of mother is a means to an end and a point of departure rather than a point of arrival. She is not possessive, but realises her children are not more for her than a temporary loan. She is not afraid of life, but realises that where caution is a virtue, fear is only a vice. Life must be lived dangerously, and although danger requires no seeking, when it is inevitable the safest thing to do is not to shirk it but to face it wisely. She does not expect her children to be perfect and would rather see them strong and happy, even if there were at times room for improvement in their cleanliness, manners, and clothes. She realises that goodness is more a matter of the inward spirit than the outward form, and the inward wish than the external condition. She likes to see her children as they are, rather than as they

ought to be, and is content to see them grow according to their own spontaneous individuality, rather than according to her own maternal prejudice. She does not want them to be the best, nor expect them to be the worst, amongst their fellows. She does not use criticism or praise unduly, but each as it is due. She recognises her children as separate individuals, sometimes asking for her help, sometimes rejecting it; sometimes succeeding, sometimes failing, but always growing according to the way of their own urge. She holds no apron-strings, but shares her experience and wisdom when it is sought for and is content to be a lifelong comrade. Her greatest task is to regard her function as limited and herself as no more than a means to an end. The end is the mate to whom she must surrender first place, with the reward that in doing so the number of her children and the source of her happiness will be doubled.

FIG. 3.—"*Highly Strung.*"



"I ought" and "I wish to go back to my mother" are always in conflict. Each one activates the other's opposition. Only "I will go on in my own way" is single and free from conflict.

This diagram has been found useful to illustrate these points, both to individual patients and in lectures. It is intended to show the three forces which motivate us all: the will to go on, the wish to go back, and the fear of authority.

The above picture may be told as a dream story:—

"It was raining and dark. I was standing out on a road, and in front of me there was a high brick wall with spikes on the top. Behind me was my mother with her arms outstretched, and she seemed to be drawing me towards her. Behind her was my father, looking very fierce, with a stick upraised in his hand. I knew that the other side of the wall was a very beautiful girl, and her arms were stretched towards me also, but I felt afraid to climb it because it was too high. Beyond her, in the distance, was what I knew to be my goal, and there the sun was shining.

"I went a few steps towards my mother, but it became darker, and the face of my father was more threatening as he made gestures with the upraised stick. Then I turned to climb the wall and my fear seemed to leave me. As I approached it the sky became lighter and the wall less high. I managed to scale it and dropped the other side, where the girl met me and we walked on up the road together."

ILLUSTRATIVE CASES.

CASE Q.—Male; unmarried; aged 33; grocer's manager.

Complained of: Insomnia, depression, thoughts of suicide. Everything too much trouble. Terrible headaches. Impulse to throw himself under passing traffic. A few days previously he had disappeared for 48 hours and had been found at Southend.

Duration of Symptoms: About two years.

Family History: He had one elder brother, two younger brothers, two younger sisters. Father living. Mother had died two years previously.

History: The beginning of his symptoms followed his mother's death. At that time he had been the eldest son at home. He stated that his mother had refused to have anybody but him to nurse her, which he had done for six months before her death. He said that his mother could not stand her husband near her whilst she was ill. The patient stated, however, that he got on well with his father. Masturbation had commenced at 15 and continued up to date. He had read that it would cause all kinds of physical disorders and possibly insanity. He said that he had never, at any time, taken any interest in girls, but that his mother was his greatest pal, to whom he took all his troubles and in whom he could always confide. He felt that no one could ever replace her. Since his mother's death he had felt that he had no one with whom to share his worries. He had been asked to take over the management of the business, but he had felt that it was too much for him without his mother's support and encouragement. He could have managed it, he said, without any difficulty had he had his mother to help him. He had at one time spent a holiday with his mother at Southend. On his way to business one morning he felt an irresistible impulse to return there, which he accordingly did. He stated that he had the clearest visions of his mother. "I could see her as if she were coming towards me, as plain as you are." He felt that he was rejoining his mother at Southend and his intention was to commit suicide. He did not do so, however, but wandered about until he was discovered and taken home.

In the course of several interviews the patient talked a good deal about his mother, and it was explained to him that he needed to face the fact of his mother's death and to realise how excessively he had been dependent upon her. After a fortnight he said that he was feeling much better, that his sleep was returning, and that he had not been so depressed. He said, "I did not even go to see my mother's grave last week." After another fortnight he was able to return to work and stated that he was feeling normal. After that he did not return for further treatment.

CASE R.—Male; married; age 50; bank clerk.

Complained of: Sudden suicidal impulse in which he had made an abortive attempt at cutting his throat during a period of temporary depression.

Family History: His father had died of delirium tremens when he was 3 months old. He was the youngest child, with six sisters older than himself and no brothers. His mother had been left very poorly off and had had to work very hard, which caused her to become embittered. He said that he could never remember his mother kissing him or giving him a kind word, but his sisters had been inclined to spoil him.

History: He had married a woman 12 years older than himself, who was well-meaning but rather hard and authoritative. She always knew what her husband ought to do and expected him to do it, and had never discovered the difference between "taking a horse to the water" and "making him drink." She just expected him to do so, and if he did not, her feelings were compounded of self-pity and well-justified criticism. There were no children as the wife had had an operation for ovariectomy early in her married life. His sexual life had been uneventful, except that he had found himself liable to be unduly attracted by any girl who was a little extra nice to him. There had been a small affair with a typist at the bank, whom he had on one occasion taken to the pictures. His wife got to hear of it and had been filled with righteous indignation. It was not so much that his peccadillo was often referred to, as indeed it frequently was, but that he felt that it was always there between himself and his wife, and he was filled with remorse. To refer to it was his wife's strongest card, which she sometimes played with great effect. It was his Sword of Damocles.

He was over-conscientious and was in the habit of worrying unduly about his work. For the past year before the suicidal impulse, he had been working under a manager at the bank whom he did not like, and this had caused constant irritation and anxiety. He was in the habit of bringing his worries home with him and discussing them, over and over, with his wife. On the evening of the suicidal impulse he had wanted to talk about his troubles, but his wife had refused to allow him to do so, and he had felt her to be hard and unsympathetic. She had suggested that his worries were really due to some moral failure which was on his conscience, and in a moment of desperation he had said, "Yes, I have lied to you. I have always lied to you. I am lying now, and I shall always lie to you." He was, in fact, a most truthful and most conscientious man, and this was only a desperate, hysterical, rhetorical gesture. His wife was horrified but coldly superior, and told him that she was ashamed of him, and if he felt like that he had better go to bed, when she would make him a cup of tea. He went into the bathroom and locked himself in. A few minutes later he was found in a dazed semi-conscious condition, bleeding profusely from a wound in the throat where he had cut himself with a razor.

A month after the event he came for treatment. There

were no signs of depression and it appeared to be clearly a case of hysterical fugue due to an impulse of the moment, caused by a feeling of frustrated love hunger. He said that he had always felt that he had wanted someone to take his mother's place. His wife, he said, had always been a very perfect wife to him—although he quite wrongly felt that at times she did not give him the sympathy and affection which he required. (Under different circumstances his wife might have been adequate, but she was not adequate for him.)

CASE S.—Male: divorced; age 41; an ex-garage proprietor who had been out of work owing to his illness for about five years.

Complained of: Intense suicidal feelings. A desire to murder people and smash things. Feelings of horror with regard to sex. Terrible pains in the head and feelings of impending disaster.

Family History: The patient's father had been an alcoholic, and had died when he was 15. His mother had been a woman of loose morals. He was the youngest son with three brothers and a sister. One of his brothers had had a severe nervous breakdown, but had recovered after two years.

Physical Signs: No signs of physical disorder. Reflexes all very much exaggerated. Wassermann negative.

History: About the age of 9 he described how he had had a fight with his father, who had come home drunk and tried to assault his mother, abusing her and flinging things about. He had struggled with his father, and said it was touch and go as to who won. He said that at the time he hated his father with a furious hatred, and vowed, "You won't beat me." He always felt afraid of his father and an intense resentment towards him. He sometimes felt that he would like to murder him.

His childhood evinced abnormal sexual curiosity, with many experiences of a sexual nature with domestic servants, &c. His first experience of sexual intercourse was with a housemaid at the age of 15, when he was impotent. He had always regarded sex with a combination of lust and horror. Masturbation was very frequent from 15 to 21. He was typically an extravert and an exhibitionist, and his sexual experiences always tended to involve self-display. They were always regarded afterwards, however, with extreme self-reproach and emotional conflict.

At the age of 15, when his father died, he stated that for some months his mother took him into her bed. He had intense sexual feelings with regard to his mother and would try to touch her secretly whilst she was asleep. He said, "I had excited, weird feelings that she might slightly awaken and accept these advances in some way, because my father was dead." At the same time, he had an intense feeling of disgust and impropriety. He had suspicions, at the time, of his mother's infidelity. His mother would have parties in the house at which a good deal was drunk, and he suspected that immorality was taking place. He felt that he wished to spy on her, but he then got the idea of conniving at his mother's infidelity and protecting her. When he did this he said that although he felt that it could not possibly be true, at the same time he got intense sexual excitement from believing that it was true. At this age he had a nervous breakdown which lasted for some months, in which he was intensely afraid of everything.

At the age of 17 there was a very typical sexual experience in which he spent the night with a girl in a car in a garage. He attempted intercourse but was impotent. In the morning when his mother wished to know where he had been, he told her that a girl had tried to seduce him, but that he had spent the night in praying with her that she might be converted from her evil ways.

With regard to sex, he stated that he felt that all women should be like the Virgin Mary, and that one ought not to have any feelings of a sexual nature with regard to them. He felt, however, that it was himself who was the cause of their falling into sin, and yet that he wished to destroy their purity. He said, "I believe the devil is in me. I am a devil. I am sexually a wreck and a criminal. I always feel I want to let women down." At other times he said he felt like Christ, and that he wanted women to wash his feet. On the other hand, women of the prostitute class had a special fascination for him, and he said, "I was always wanting to save women on the streets. I had an intense horror of prostitutes, and they had a sexual fascination for me, but I always felt I wanted to make them into good women." After any sexual experience, at which he was usually impotent, he said that he felt, "Now that I have done that, I am finished and done for."

On one occasion, he said that he spoke to an old woman of about 60 of the poorest class, whom he met in the street. At the same time he felt absolutely terrified, and ran away from her in a panic, but could not forget the experience. He was for some time on the professional stage and had great natural ability as an actor.

At the age of 25 he married a girl whom he knew to be immoral. He was at first impotent, although he had in fact previously had successful coitus with her, but even in marriage his sexual feeling was associated with a most intense guilt. Very early in their married life quarrels developed and they led what he described as "a cat and dog life." He was sure that she was unfaithful to him, but he found that he got more excitement from feeling that she was unfaithful than from anything else. When he was in bed with her he imagined that it was not him but someone else, and that she was a prostitute, because in that way he got greater sexual excitement. He found himself again conniving at his wife's unfaithfulness, in the same way that he had connived at his mother's. It was as if sex meant guilt, and that, without guilt, sex possessed no attraction. They had one child, who was a constant source of quarrelling, and after about ten years he finally divorced his wife for infidelity.

His nervous breakdown had lasted for about five years. During that time, as he had no money of his own and his relatives disowned him, he had been taken pity on by a woman who ran a nursing home, where she allowed him to live. She was some 20 years older than himself, and his feelings were that he hated her and wished to murder her. He felt that her intentions were immoral towards him, although, in fact, it was only out of the kindness of her heart that she had taken pity on him. He felt that she was an immoral woman who was keeping him, and from this he got both torture and satisfaction. He could not bear to see two people in love without feeling a wish to murder them. He could not see a girl's leg as she walked down the street without an intense conflict being aroused. Anything that was beautiful he felt an irresistible impulse to break, and all the time he felt that he was the very incarnation of wickedness, outcast and condemned. He fell in love again, but the girl was for him completely idealised and unreal. She was at times the source of most intense conflict, because although he had idealised her, he sometimes felt she was no better than a prostitute.

Course: When he came under analytical treatment he had been ill for five years and was getting progressively worse. Analysis took the form of history-taking and catharsis, with most intense emotional abreactions, but had to be frequently abandoned. It was decided that the environment in which he lived was maintaining his emotional conflict, and he was therefore transferred to a hospital where after some months, during which he was in the care of the hospital physician, he fulfilled his oft-repeated threat and committed suicide.

Suicide.

The above three cases were chosen from among many as illustrative of the problems relating to the mother, sex and women. It is, however, significant that in each one of the three there was a strong suicidal impulse, one of which was nearly successful, one only abortive, and one quite successful. In their reports of cases of suicide, coroners do not perhaps tell all that they know, nor do they know all. Suicide must be included amongst examples of purposive behaviour, but the purpose is not always conscious. Viewed superficially, suicide may be said to be due to depression, or to a wish to escape from insuperable difficulties. But we may ask what is the cause of the depression and if the escape is made, may it not also be an escape towards a desired goal?

If we consider these deeper motives, we may divide them into three:

1. Self-punishment.
2. Self-deprivation.
3. Regression.

Self-punishment is the unconscious motive introduced by a feeling of guilt. Self-deprivation, the final act of which is the taking of one's own life, is often associated with such gestures of castration symbolism. But finally there is death as the desired goal and haven of peace, rest and freedom from pain and responsibility. Suicide is a flight from reality, but it is also the great return towards the all-embracing arms of maternal oblivion. It is suggested, therefore, that there is a very deep and intimate connexion between suicide and certain extreme degrees of mother fixation.

SPECIAL ARTICLES

PHOTOGRAPHY OF THE STOMACH WALL.

AN INGENIOUS APPARATUS.

In 1929 Herr F. G. Back, an engineer, working in Prof. Wenckebach's clinic in Vienna, with Prof. Otto Porges and Dr. J. Heilpern, devised an apparatus designed to take photographs of the stomach wall in the living subject. This apparatus has since been used with success by various observers in Europe and America [1 2 3 4 5] and has been put on the market by an American firm under the name of the Gastrophotor.

The apparatus consists essentially of (1) two miniature stereoscopic cameras attached to the distal end of a rubber tube like a stomach-tube, and (2) a transformer. No lenses are used, but miniature pinholes ensure that the cameras are properly focused under all conditions and that distortion is avoided. Each camera has four little films, each ¼″ wide by ¾″ long, placed behind four pairs of pinholes in such a way that with each exposure eight pairs of stereoscopic photographs of the interior of the stomach are obtained. The tube to which the cameras are fixed is of a semi-rigid type, therefore no significant torsion occurs during insertion, which must be achieved without using any lubricant, such as glycerin, which might obscure the glass cylinder round the camera. The shutters of the cameras are two sliding rings. No parts protrude so that no harm can be done to the patient when the camera is being operated. The absence of torsion while the tube is being inserted is important because each of the films is marked for insertion according to its position (posterior, lateral, or anterior). It is thus possible to locate the section of the stomach wall that is recorded on each picture. Approximately 75 per cent. of the stomach wall can be photographed.

The light consists of a special filament lamp five-sixteenths of an inch in diameter which is arranged between the cameras. This lamp produces an instantaneous blue light of 12,000 candle power in 1/120th of a second, and the exposure is so brief that even the most rapid peristaltic movements do not spoil the photo. The filament is burned out at each exposure. The lamp does not become hot. The only lubricant used is a special paste of white wax and lanolin equal parts, which is applied to the joints in order to prevent any gastric juice from entering the cameras and possibly damaging the films. The telescopic cameras are operated by means of a press button on the handle of the instrument. This handle contains also a rubber bulb for inflating the stomach with air before the photograph is taken.

A special *transformer* is provided with the camera which permits the use of the apparatus on direct or alternating current of any given voltage. On this transformer there is a special safety fuse, so that all danger to the patient is avoided.

The Technique.

The introduction of the tube and the taking of the photograph is said to be a simple matter. No anæsthetics are required, but the tube must, of course, be passed into an empty stomach. The best arrangement is for the patient to have no breakfast, having had a light supper the night before, and the photographs are taken in the early morning. The cameras are loaded with films in the dark-room and the apparatus is actually used in open daylight, the patient standing, sitting, or lying. It is, of course, possible to take the photograph under direct X ray guidance of the metal part of the tube, but this is not usually found to be necessary. The tube is introduced in the same way as an ordinary stomach-tube. A slight obstruction is felt and overcome when the cardia is reached, and passage through the cardia is easily recognised by the careful observer. The stomach is then gently inflated through the tube, experience and the sensations of the patient being a guide to the amount of inflation. For the first exposure a rubber tip about an inch in length can be attached to the camera. This facilitates introduction of the tube, and the fact that it is not rigid gives confidence to the manipulator in passing it down till a slight counterpressure is felt. The approximate distance the tube should be passed is estimated in advance by measuring on the bougie a distance from the teeth to the navel round a curve approximately corresponding to that of the back of the mouth. A metal ring marks this position. For a second exposure, especially necessary where pyloric trouble is suspected, a metal cap only ¼″ long replaces the rubber tip.

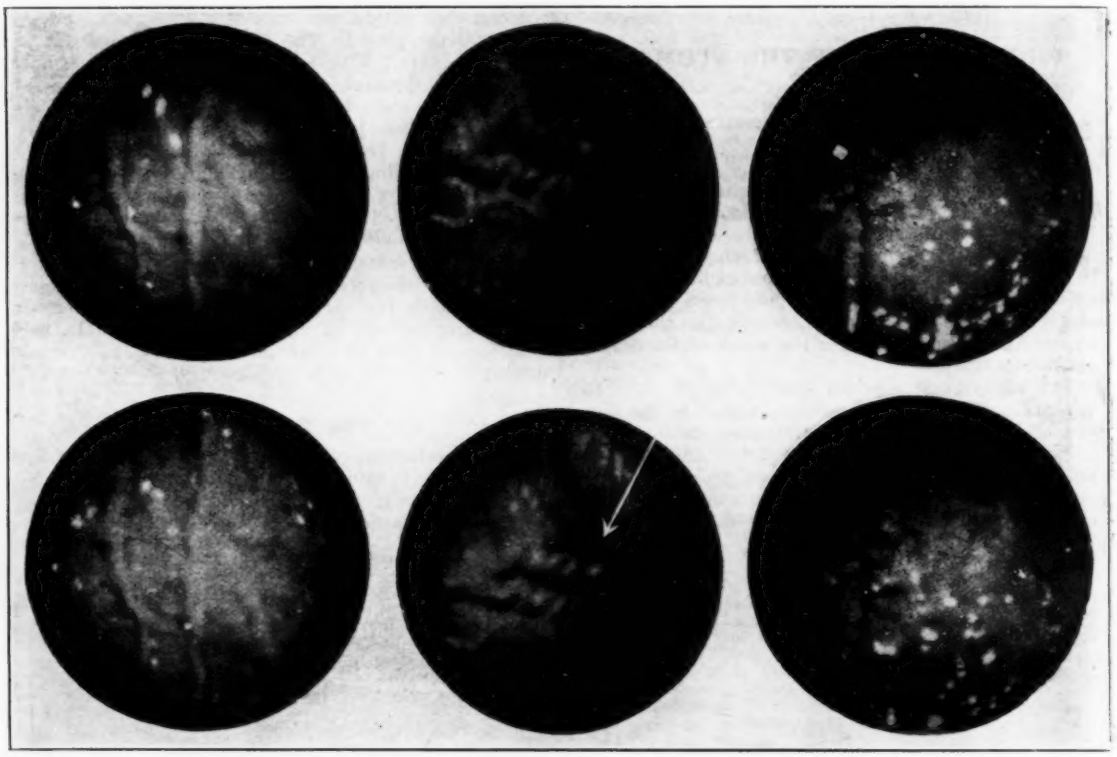
The exposure is made by a slight pressure of the

FIG. 1.

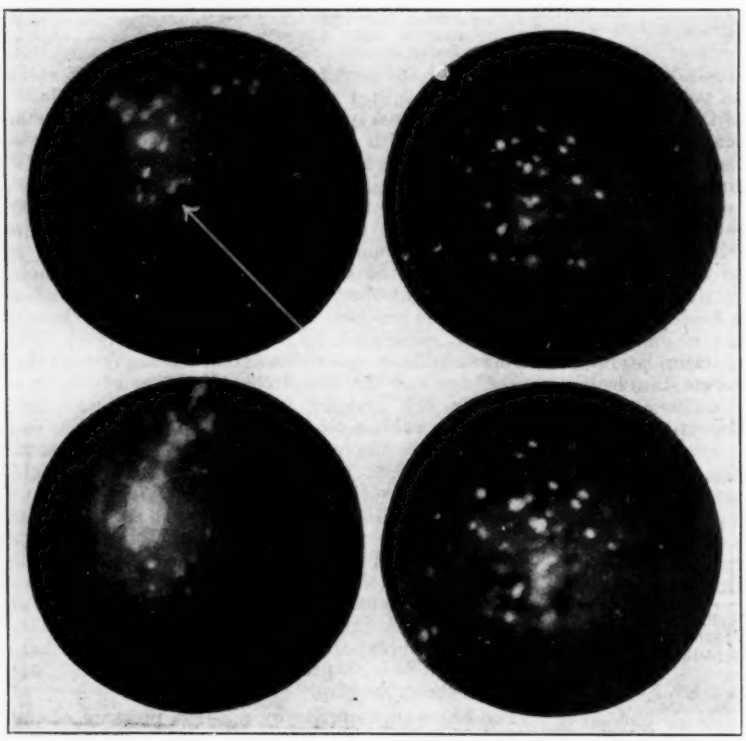
The gastro-photo, which consists of a rubber tube to which two telescopic cameras are attached. The tube is connected with a transformer which enables it to be used with any electric current.

[1] Heilpern, J., and Porges, O.: Klin. Woch., 1930, ix., 15.
[2] Husserl, H.: Wien. Med. Woch., 1930, No. 23.
[3] Husserl, H.: Fortschritte auf dem Gebiete der Röntgenstrahlen, 1930, xlii., 342.
[4] Ehrentheil, O. F.: Wien. Med. Woch., 1930, No. 46.
[5] Bernstein, B. M., and Gray, I.: New York State Jour. Med., 1930, xxx., 433.

FIGS. 2 3 4



FIGS. 5 6



handle button and by a touch on the exposure button on the transformer. The handle button is then released and the tube is withdrawn. The whole procedure is said not to take more than 20 seconds, and to be free from more than very slight discomfort to the patient. The films are then developed and in cases of urgency they can be inspected while still wet under a microscope. When they are dry a special view-box permits of an exact enlargement (100 times). Since the distances of the pinholes from the camera are known, also the angle of incidence of the photograph, a

Descriptions of Illustrations.

FIG. 2.—Normal folds of the stomach wall.

FIG. 3.—"Chronic gastritis" round pylorus. Note prominent tortuous veins. Arrow points to pylorus.

FIG. 4.—Resection scar. Note traces of stitches.

FIG. 5.—Single ulcer on bend of lesser curvature.

FIG. 6.—Early carcinoma, with strawberry-like surface.

Each pair of photographs is taken at the same time, by the two cameras. The prints obtained show them close together, so that they can be examined stereoscopically.

photometer provided with the apparatus makes it possible to ascertain exactly how large an area of the interior of the stomach every film represents.

Interpretation.

The reading of the photographs calls for special study. It is of fundamental importance to be able to distinguish simple reflections of the mucosa from projections and cavities. This differentiation is facilitated by the fact that a projection has a shadow thrown by the light between the cameras, whereas in the absence of any projection or cavity there is a shadowless bright reflection only. It is claimed that after some experience, and help from those who have made a special study of interpretation of these photographs, it is easy to detect acute and chronic gastritis, ulcers, scars, polypi, and new growths, and even to recognise whether an ulcer is in a state of healing or the reverse.

The cost of one set of cameras complete with transformer is £120. Since it is usual to make two exposures at the same sitting, it is convenient to have a second camera (£30) to avoid the delay of cleaning and reloading. The price of the enlarger is £10. The apparatus can be seen at Messrs. Allen and Hanburys, Surgical Instrument Department 48, Wigmore-street, London, W. 1.

A similar instrument is available for taking photographs of rectal conditions, and one adapted for the larynx is under trial.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

GENERAL PRACTITIONERS AND PUBLIC SERVICE.

A MEMORANDUM on the coördination of health services has been submitted to the county council of Lanark by the Lanarkshire Medical Practitioners' Union and the local division of the British Medical Association. The memorandum follows the broad general lines of the B.M.A. scheme. It states that within recent times the public health services have encroached more and more on the daily work of the general practitioner. The public health department of the county has definitely reached a stage at which wider extension necessarily involves the appointment of general practitioners rather than specialists to the staff, and this immediately raises questions of policy of the first importance. The question of whole-time officials must be considered against the alternative plan of bringing the general practitioner into closer association with the public health service. The practitioners recognise the excellent work performed in the past by whole-time health officials, but they think the time for a new departure has arrived. They suggest that much clinical work—e.g., inspection and treatment of school-children, maternity and child welfare, and domiciliary treatment of tuberculosis—could be efficiently performed by general practitioners on a part-time basis.

It is worth noting that in the early days of medical inspection and treatment of school-children, this scheme was proposed by the B.M.A., but was dropped after trial in several localities. Now, however, the system is so elaborate that there is work for part-time specialists, and the same is true of maternity and child welfare work. As for domiciliary treatment of tuberculosis, the insurance practitioners are already under certain obligations to look after their tuberculous patients at home; but the local authorities will no doubt consider the expense of whole-time as against part-time practitioners.

On the treatment of the poor, the memorandum states that the sick poor should not be segregated for purposes of medical relief, for there is no reason why they should in times of stress be compelled to leave their own doctor. Great stress is also laid on the need for diagnostic facilities, and it is suggested that the county council should provide diagnostic centres throughout the county, the staff to consist of general practitioners and specialists in the various departments, all on a part-time basis and remunerated by a sessional fee.

"In these matters," the memorandum concludes, "reference has not been made to the medical officer of health, but the medical profession fully and frankly recognise that in schemes of this type the medical officer of health for the county must be the supervising and controlling authority. They regard it, however, as of the first importance, that the general practitioner should be brought right into the scheme."

Lanarkshire is the largest county in Scotland and, in public health, it is probably the most "advanced." There is not likely to be any violent antagonism to the views of the medical practitioners, and there are obvious openings in this scheme for many useful adjustments. The county of Lanark, including the towns, contains over 500,000 people, and it will be interesting to watch how this large county organisation will adapt itself to the detailed work of practice. One obvious problem is how to enable the private practitioner's patient to secure the value of modern diagnostic appliances and treatment, for these are problems that the domiciliary practitioner cannot longer face adequately by himself. In the large cities a certain amount of unregulated diagnostic service is available; but the time has come for making this service overt and sufficient.

CUBICLE WARD FOR PAYING PATIENTS.

Colonel J. A. Roxburgh, chairman of the managers of the Western Infirmary, Glasgow, has built and equipped a cubicle ward of seven beds for paying patients at the David Elder Infirmary at Govan in Fife. In opening the ward on Jan. 30th he spoke of the needs of people who were willing to pay something for their treatment but could not afford the high charges of nursing homes, with specialists' fees besides. At present the only treatment they could get, outside the general wards of the hospitals, was beyond their means. But if they were asked to pay anything he thought they should have a measure of the privacy which differentiates hospital from nursing home. The new cubicle ward had been built as an experiment. For the present there would be no fixed charge, but the patients would all be expected to pay something.

The ward is divided by partitions and curtains into seven cubicles each with enough space for a bed, a locker, and a chair. The patients can either enjoy complete privacy or, if they wish, the cubicles can be thrown open to form what is practically a single ward. Each cubicle has a wireless receiving apparatus.

The David Elder Infirmary is an annexe of the Western Infirmary.

THE PEKIN SKULL.

Under the auspices of the William Ramsay Henderson trust, which exists for the promotion of cerebral physiology, Prof. G. Elliot Smith, F.R.S., recently delivered a lecture in the University of Edinburgh on the discovery of the Pekin skull.[1]

[1] See THE LANCET, Jan. 24th, p. 198.

He said he regarded the fossil remains of this early Pleistocene man as the most significant and illuminating relics of early man that have ever been discovered. Although it is impossible to speak with certainty, it appears entirely probable that it is at least a million years old. No implements of any kind have been found on this site in the last three years, despite very careful search, and it is thus impossible to say whether the Pekin man had developed the elements of craftsmanship or not. The chances were that a creature who had so far acquired the cerebral development distinctive of the human race would have used instruments of some sort, even if nothing more than sticks for offence or defence, or for grubbing up roots.

PROFESSORIAL CHANGES.

At a recent meeting of the University Court Prof. Arthur Robinson intimated that he would resign from the chair of anatomy as from the end of the present academic year. He has added extensively to our knowledge of embryology, and his work on prenatal death bids fair to be included in the list of classical researches.

The successor to Prof. Sutherland, who retired at the end of the last academic year, has been appointed by the Court of St. Andrew's University. The new professor of pathology is Dr. Daniel Fowler Cappell, who was lecturer in pathological histology in the University of Glasgow. Prof. Cappell is a graduate of Glasgow University and has been associated both in teaching and research with Prof. Muir. He was M'Cunn scholar from 1921 until 1923, when he became assistant to Prof. Muir and also assistant pathologist to the Western Infirmary. In 1928 he received the Foulis research scholarship, and his investigations have earned him a considerable reputation. He has also been appointed to the associated post of pathologist to the Royal Infirmary, Dundee.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

LEGISLATIVE CONTROL OF DRUGS.

IT has been felt for some considerable time that legislative action would have to be taken to control the manufacture and sale of drugs in India. For years the annual research workers' conference, held in Calcutta, have passed resolutions begging the Government of India to take some action in the matter. In 1927 the Council of State adopted a resolution urging provincial governments to take such action as might be possible to control the preparation and indiscriminate sale of medicinal drugs. In August last the Government of India appointed a small committee to explore and define the scope of this problem and to make recommendations. Lieut.-Colonel R. N. Chopra, I.M.S., professor of pharmacology at the Calcutta School of Tropical Medicine and Hygiene, has been appointed chairman of this committee, the members of which, three in number, include Father J. F. Caius, pharmacologist at the Haffkine Institute, Bombay, and Mr. H. C. Cooper, F.C.S., representing one of the leading firms of manufacturing chemists in India. The terms of reference are wide; they are to inquire into (1) the extent to which drugs and chemicals of impure quality and defective strength, particularly those recognised by the British Pharmacopœia, are imported, manufactured, and sold in British India; (2) the necessity in the public interest of controlling such importation, manufacture, and sale, and to make recommendations; to report how far these recommendations may be extended to known and approved medicinal preparations other than those referred to above, and to medicines made from indigenous drugs and chemicals; and (3) the need for legislation to restrict the profession of pharmacy to duly qualified persons and to make recommendations.

THE COMMITTEE GETS TO WORK.

The committee have already taken evidence in Madras, Calcutta, Patna, and a few other small stations. Questionaires have been issued to the general medical public, pharmacists, and manufacturing chemists, and those with any special experience have been requested to submit memoranda. It was at one time feared that its work might be boycotted by the Congress, as it had been suggested that the formation of this committee was the Government's reply to the boycott of British drugs. No charge could have been more absurd. The inquiry which has been contemplated for years is designed to place the manufacture of drugs in India on as sound a footing as it is in England and America. Happily reason prevailed and the committee has been well supported on the whole, although the names of some of Calcutta's leading Indian practitioners are missing from the list of witnesses. The stories told became monotonous in their similarity to one another; bottles labelled cocaine but containing bicarbonate of soda, others labelled quinine from which the alkaloid was absent, inactive tinctures, and prescriptions for 10 grains of potassium iodide to the ounce made up with only one. Few were satisfied with the present state of affairs; some made helpful proposals as the lines on which legislation might be introduced, others amusing ones. One patriot suggested that the importation of drugs should be entirely prohibited; India could manufacture her own—if not at the moment, factories could be built; the Government should order a factory or two. The necessity for this committee grows more apparent as each witness is called.

RESEARCH WORKERS IN CONFERENCE.

The All-India Conference of Medical Research Workers, which held its eighth annual meeting in Calcutta last November, is more of the nature of a business conference than a scientific one. Representative research workers from the various provinces meet to discuss the best way to use the available funds. Short résumés of past work and programmes of future work are read, and resolutions are circulated to the Governments concerned. In his opening address Major-General J. W. D. Megaw, D.G., I.M.S., claimed that he was in a sense the father of the conference, as it was at his suggestion that seven years previously the first conference was held. Discussing the general policy of the Indian Research Fund Association, he said he had heard complaints that this was an I.M.S. reserve. He had taken the trouble to obtain the actual figures of the whole-time employees of the Association; they were as follows:—

I.M.S. officers—all European	4
Military assistant or subassistant surgeons—all Indians or statutory natives of India ..	11
Independent medical practitioners, of whom 4 were Europeans and 33 Indians	37
Independent workers, non-medical, of whom 3 were Europeans and 18 Indians	21

The Association also footed the bill for research done by numerous research workers, both Indian and European, whose salaries were derived from other

sources. Whatever point this criticism might have had in the past, it was not applicable at the present day. Subcommittees on kala-azar, cholera, rabies, plague, and malaria were constituted to formulate suggestions for the coördination of work on these subjects. Amongst the resolutions passed was one urging the foundation of cholera commission.

AN ALL-INDIA INSTITUTE.

The buildings of the All-India Institute of Hygiene and Public Health, which is being presented by the Rockefeller Foundation, are now rapidly rising and have reached the first-floor level. The Institute faces the Calcutta School of Tropical Medicine, and it is to be opened, if all goes well, next January. Meanwhile the scheme for a central research institute at Dehra-Dun is dead. Its death duties, however, are likely to be heavy, and whatever scheme succeeds will have to be a more modest one. There is strong opposition from all quarters to the extensive sinking of capital in bricks and mortar.

MEDICINE AND THE LAW.

A Question of Ambulance Practice.

THE London County Council has rightly taken notice of a recent case at the Central Criminal Court where the jury, supported apparently by the opinion of the judge and of a distinguished medical witness, censured the "ambulance authorities" for leaving an ambulance "in the middle of the road," and recommended that instructions be given "to obviate this in future for the protection of the public." The facts will enable an opinion to be formed. Last November a woman was knocked down by a motor cyclist on a Greenwich road which was about 30 feet wide. Summoned at 10.33 P.M., the ambulance was stopped by a police officer about 7 feet from the kerb. The injured woman, only semi-conscious owing to concussion, lay about 4 feet from the kerb. The motor cyclist, also injured, lay on the pavement. The woman had scalp and face wounds which were bandaged without moving her. At this point a motor-car, driven through the onlookers at great speed in spite of the warning of a police officer who was standing a few yards from the ambulance, caught the woman, carried her along for several yards, and then threw her down, one wheel passing over her body. The patient, now more gravely injured than before, was again bandaged, and was removed to hospital where she died within two hours. The motor-car driver, a Royal Artillery officer stationed at Woolwich, was tried at the Central Criminal Court on various charges—manslaughter, being drunk in charge of a motor-car, and causing bodily harm to the woman by wanton driving. He was found "not guilty," and the jury added the rider already mentioned. The judge said he thought the rider quite reasonable; in his own view it was "a wrong practice to bandage people in the middle of the road; an injured person should be removed to the side-walk as quickly and gently as possible, and then transferred to the ambulance." Sir William Willcox, in giving evidence for the defence, had previously said he thought it ill-advised to treat the patient on a London road at night, and that to have lifted her to the pavement for treatment would have been no greater risk than lifting her into the ambulance. The position of the ambulance (a conspicuous and well-illuminated object) and the consequent traffic arrangements would seem to depend in part at least upon the directions of the police officer when (as happened on this occasion) a police officer is present. But there remains the important question, a question to be answered not by judge and jury but by the best medical and surgical opinion, whether or not a seriously injured patient ought to be moved without examination and treatment or not. The jury said it was negligent to leave the ambulance "in the middle of the road" (i.e., 7 feet from the kerb on a road 30 feet wide); the judge suggests it was negligent not to lift her at once to the pavement. Technical opinion, on the other hand, indicates that negligence might lie in the opposite direction. "First Aid to the Injured," the St. John Ambulance Association text-book, observes that, where there are fractures (a not infrequent contingency in road traffic accidents), "no matter how crowded the thoroughfare or how short the distance to a more convenient or comfortable place, no attempt must be made to move the patient until the limb has been rendered as immovable as possible by splints or other means of restraint, unless life is in danger from some other cause." The Red Cross Society's text-book contains similar instructions. The Central Public Health Committee of the London County Council has specially consulted a number of experts in view of the recent incident; they unanimously support the view that the correct procedure was followed in the case under discussion.

The rider of a jury can be taken too seriously. It may indicate merely the tenacious pursuit of some red herring trailed by the defending counsel who is trying various expedients in default of, or in addition to, other more promising lines of defence. The observations of a judge, too, in reassuring a jury when the trial is over, are informal civilities of even less judicial value than obiter dicta uttered during the discussion of some point of law. It is not clear whether the opinion of the medical expert, who was a witness for the defence, was an *ad hoc* observation upon a special set of facts or a general and considered view upon an abstract issue. Meanwhile it is important that no doubt should exist on the question of ambulance treatment—namely, whether it is wrong to move the seriously injured patient without examination (as the technical publications suggest), or wrong not to move the patient quickly (as the judge suggests). There should be a definite ruling one way or the other by experts in ambulance practice and training in consultation with the Commissioner of Police whose officers are not only responsible for traffic control but are also themselves qualified in first-aid treatment. The question, it may be submitted with deference, is not primarily a question of law.

PAY BEDS AT WEST LONDON HOSPITAL.—It is proposed greatly to extend the system of pay beds at the West London Hospital, Hammersmith. There are, at present, 26 such beds, the occupants of which pay five guineas a week for a single and four guineas for a double room, plus a fee for specialists' services. It is now intended to erect a new wing to accommodate 126 paying patients at an inclusive charge, graduated according to ability to pay, with a minimum of seven guineas a week. This fixed payment will cover all services, including medical and surgical treatment, specialists' fees, and drugs, and it is believed that the new policy will remove from a large class of patients of moderate means the fear that the total cost of a hospital operation will be beyond their means. When the new wing has been built it is expected that this side of the hospital's work will be self-supporting. The scheme will involve the rebuilding of the whole of the front of the hospital which abuts upon the main road and is exceedingly noisy. It is estimated that between £150,000 and £200,000 will be needed to complete the scheme.

THE SERVICES

HEALTH OF THE ARMY IN 1929.

THE report on the health of the army[1] is signed by Lieut.-General Sir H. B. Fawcus. It appears just a year after its predecessor, has 28 more pages, mainly devoted to India, and costs 2*s*. less. It registers notable advance in the struggle for greater scientific precision in diagnosis and the study of the natural history of disease. The figures are much the same as last year; the most notable changes are due to the spring epidemic of influenza in the army at home, which, however, left the Western district and Northern Ireland untouched.

The report is concerned with 9320 officers and 179,083 other ranks. Among the latter the chief causes of admission to hospital were (per 1000) "other digestive diseases," not tonsillitis nor of the liver, 55·4 (last year 51·6); injuries, 52·1 (53·3); malaria, 41·2 (35·7); tonsillitis, 37·9 (33·3); influenza, 36·8 (8·8); venereal disease, 35·0 (39·3); diseases of the areolar tissue, 34·7 (36·9). Enteric and dysentery, pneumonia, sand-fly fever, and scabies were much as in 1928. Gonorrhœa is treated with exotoxin in England, and cases leave hospital at home six days sooner than abroad, where each lasts 60 days. The death-rate was 2·45 (2·36), the chief causes being injuries, 104 (133); pneumonia, 63 (59); "other digestive," 53 (44); suicide, 30 (25); enteric group, 20 (20); influenza, 19 (1); tuberculosis, all, 25 (30). The invaliding-rate was 10·10 (9·06), chiefly due to disease of the middle ear, 260 (246); and tubercle, all, 233 (207); 47 (34) were discharged for hysteria. The disease causing most loss of service is gonorrhœa, and next to that is inflammation of areolar tissue. Scabies cases, 718 (703), averaged each a day longer under treatment than in 1928. Dysentery in India is about 80 per cent. bacillary. Of 92 cases of hepatitis and liver abscess, 74 were amœbic, but 50 gave no history of previous dysentery or diarrhœa. Enteric was reduced at home, slightly increased abroad. Women and children were better protected by inoculation in the army generally, officers and men, in India. Command laboratories are giving great satisfaction in India; they are staffed in part with assistant surgeons, of whom we do not think we have before heard in the army; food-handlers were examined to the number of 15,922, and 12 with enteric group bacilli were isolated; none of the carriers had been associated with any outbreak of disease. Malaria gave a larger admission-rate this year, as there were many cases on the N.W. Frontier. There was also a case in England, in a man who had never been in a malarious country; he had tertian periodicity with *P. vivax* in his blood. "Cold storage" of troops and screening of barracks continue to give satisfaction in India, as does plasmoquine in treatment. The short fevers are being carefully investigated, and we are glad to see P.U.O. readmitted as a diagnosis when the origin really is, after consideration, uncertain. Three cases from Egypt seem to have been due to *M. catarrhalis*. There was, perhaps in Malta, a case thought to be sand-fly fever, but many films were studied by two experts for two hours each for three days, when a single malarial parasite was at last seen; typical benign tertian developed some weeks later.

Consideration is being given to the prevalence of pulmonary tuberculosis by units, by ages, and by length of service. Why is there twice as much in the Foot Guards as in the infantry; and why does liability become doubled after ten years' service? At any rate, this disease is being seriously investigated, as well it may be, when through it 209 men are lost to the service in this one year. Except for Jamaica, China shows most venereal disease. It is questioned if men after operation for gastric ulcer, in or out of the service, are fit to stand hard work. Of appendicitis 805 acute cases are reported with six deaths, and 129 chronic, who all recovered after operation. From one kidney there were removed 10 large and 140 small calculi. Injection of coagulating liquids, usually quinine and urethane, for the cure of varicose veins has become a routine. There is a new first field dressing, gauze in 1/1000 acriflavine, sterilised. Many new operating theatres, hospital extensions, married quarters, and barracks are mentioned. Water-supply was a difficulty in Hong-Kong when the spring rains did not come, and efforts at rain-making failed, but no damage to health occurred; a new reservoir is being built. In Egypt, to reduce injuries from athletics, as the season begins graduated exercises are first practised in community. Dental treatment is being extended, but slowly, as dentists do not come forward as wished. Several stories are told on pp. 49 and 50 of benefit to general health from dental treatment. A, aged 25, had always had skin eruptions until he had five septic teeth removed, when his acne became cured. B had 76 boils in six months; he had a pulpless tooth removed and had no more boils. In other cases the diseases cured were rheumatism, optic neuritis, and lupus erythematosus. Recruits are accepted with reduced standards of teeth, if they weigh 6 lb. over the normal. A new electrically lighted otoscope is issued to recruiting officers; it has made detection of inflammatory conditions easier, and saved later rejections.

Mother and child welfare centres are more and more liked and useful. In India 826 women were confined without a death, and 1900 elsewhere, of whom one died of pneumonia and another in childbirth—one death in 2726 births.

[1] H.M. Stationery Office. Pp. 172. 3*s*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. J. D. Richmond to be temp. Col.

Maj. (temp. Lt.-Col.) A. Irvine-Fortescue to be Lt.-Col. vice Lt.-Col. (temp. Col.) H. H. J. Fawcett.

Maj. D. F. Mackenzie to be temp. Lt.-Col.

Maj. F. R. Fletcher retires, receiving a gratuity.

Lt. D. R. W. Burbury to be Capt.

ARMY DENTAL CORPS.

2nd Lt. A. N. Moon, from 43rd (Wessex) Divl. Engrs., T.A., to be Lt. (on prob.).

TERRITORIAL ARMY.

Lt. M. S. Scott to be Capt.

Lt. J. A. Matheson (late M.G.C.) to be Lt.

ROYAL AIR FORCE.

Flying Officer A. E. Vawser is promoted to the rank of Flight Lt.

The undermentioned Flight Lts. are transferred to the Reserve, Class D (ii): R. F. MacLatchy and J. J. Quinlan.

Dental Branch.—The undermentioned are granted non-permanent commissions as Flying Officers: J. G. Stewart and J. J. Lawson.

DEATHS IN THE SERVICES.

Lieut.-Colonel Samuel Ferguson Bigger, I.M.S. (retd.), who died at his residence in Bray, Co. Wicklow, on Feb. 2nd, was born in Belfast in 1854. He received his medical education in Liverpool, and qualified with the M.R.C.S. Eng. in 1875. Subsequently he graduated M.B. Lond. In 1877 he passed the entrance examination for the I.M.S., was gazetted surgeon in the following year, and was attached to the 3rd Punjab Cavalry. His service in India, which was chiefly on the military side, included the Afghan War of 1879–80, in which he took part in the Zaimusht Expedition, the operations in the Kuram Valley, and the capture of Zawa (medal). For his work with the Chin-Lushai Expeditionary Force in 1889–90 he was mentioned in dispatches and received the medal and clasp. He was principal medical officer of the Third Brigade with the Waristan Expedition of 1894 (clasp), and took part in the action of Dargai in the Tirah Campaign (mentioned in dispatches,

(*Continued at foot of next page.*)

PUBLIC HEALTH SERVICES

THE INFLUENZA EPIDEMIC OF 1929.

IN completing his statistical review [1] for 1929, the Registrar-General gives us an interesting study of the epidemic of influenza in that year, the mortality for which was the highest experienced in any year since the great epidemic of 1918–19. Allowing for the increased age of the population the mortality for the year was 734 per million, being 623 for males and 550 for females. Of this mortality, 34 per cent. occurred in February and 41 in March, the concentration on the first quarter of the year being the same as in other years since the great epidemic—viz: 1922, 1924, and 1927. In each of these four years the death-rate of the first quarter rose enormously (in 1929 by 638 per cent.), while that of the other nine months was little affected. A change of age distribution on which our epidemiologists lay great stress is now complete, for no trace remains of the remarkable diversion towards early life which was a feature of the great epidemic, the distribution being much the same for 1929 as before the shift towards youth in 1918. Those who receive these data are, we understand, always on the look-out for any sign of this shift as a new epidemic gets under weigh. Apart from a somewhat greater incidence in childhood, the proportion of deaths at each age was much the same in 1929 as before 1918, and at ages over 75 at which the proportion had tended, ever since its remarkable depression in 1918, to remain below that in 1890–1917 the latter is now exceeded. Topographically, the disease was evenly distributed, only Wales escaping lightly, while two waves of invasion spread simultaneously from the south and from the north to coalesce in the Midlands.

PORT SANITARY AUTHORITIES.

Manchester.

Dr. W. F. Dearden, in his twenty-fourth annual report to the Port Authority, mentions that no case of cholera, plague, or yellow fever appeared, that two cases of pneumonia and single cases of typhoid, tuberculosis, and scarlet fever were sent to hospital, and that four cases of malaria arrived but were treated on board. No infectious cases were notified on canal boats, but two cases of small-pox went to the hospital of a neighbouring authority. On board ships 1007 rats were killed, and on shore 2236; 36 examined were all found free from plague. Trapping killed 38 (the maximum) in one grain ship. These figures, all smaller than in earlier years, seem to indicate that rats are being reduced. Sulphur dioxide was the fumigant most often used. Among the 139 tons of food condemned, 77 were of grain or cereals. Inspection was made of 2017 ships, of which 459 had sanitary defects, and of these 341 were made sanitary before sailing. There was defect in one of four English vessels, and one in seven foreign. The chief defects were in the forecastles, of which 138 were dirty, 94 leaking; there were 74 defects in water-closets, one had indeed no flushing apparatus; that only one was so found shows how great has recently been the advance in hygiene at sea. But Dr. Dearden observes that the standard of hygiene in the ships of several foreign powers is higher than in British ships, that these other nations require crew spaces to be aft, two-berth cabins to be provided for the crew, also a messroom, and a hospital cabin, and that in fact these are being increasingly provided, whereas British ships, which were built and fitted on these lines during and after the war, were now falling back into the old bad ways. Only in providing wash-places and shower baths were the British ships still superior. He examined in 1928–29 47 new British ships, of which 64 per cent. had again put their crew spaces forward, but of 29 foreign ships only 20 per cent. Not quite half the British ships had hospital cabins though all except one foreign ship had. It will take long years to win back for us our old hygienic supremacy on the seas because, as Dr. Dearden remarks, we have no authority on the hygienic construction of ships, and what the Board of Trade desires to see it can only recommend.

[1] Text. H.M. Stationery Office. Pp. 141. 2s. 6d.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 31ST, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 286 (last week 272); scarlet fever, 1677; diphtheria, 1520; enteric fever, 28; pneumonia, 2329; puerperal fever, 52; puerperal pyrexia, 138; cerebro-spinal fever, 27; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 13; continued fever, 1; dysentery, 13; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 3rd–4th was as follows:—Small-pox, 250 under treatment, 2 under observation (last week 255 and 1 respectively); scarlet fever, 1544; diphtheria, 1950; enteric fever, 12; measles, 113; whoping-cough, 231; puerperal fever, 32 (plus 2 babies); encephalitis lethargica, 121; poliomyelitis, 3; "other diseases" 112. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 72 (1) from measles, 7 (1) from scarlet fever, 44 (10) from whooping-cough, 43 (7) from diphtheria, 66 (13) from diarrhœa and enteritis under two years, and 309 (81) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London occurred at Cambridge and Liverpool. Thirty-one fatal cases of measles were reported from Liverpool, 6 each from Bristol, Newcastle-on-Tyne, and Tynemouth, 5 from Hull. Liverpool reported 6 deaths from whooping-cough, Bolton 3. Diphtheria claimed 3 victims each at Birmingham, Liverpool, and Leeds. Diarrhœa was credited with 8 deaths at Manchester, 6 at Liverpool, 5 at Birmingham, and 4 at Portsmouth. The 228 fatal cases of influenza outside London are scattered over 76 great towns; 60 deaths were reported from Liverpool, 10 from Birkenhead, 8 from Wallasey, 6 from Croydon, 5 each from Plymouth, Birmingham, Manchester, and South Shields.

The number of stillbirths notified during the week was 295 (corresponding to a rate of 46 per 1000 births), including 41 in London.

(*Continued from previous page.*)

medal with two clasps). While in India he established a considerable reputation as an operating surgeon, particularly in operations for stone and cataract. He was promoted Lieut.-Colonel in 1898, and retired from the service in 1903. Since his retirement he lived in Bray, where he was well known as a chess player and gardener and, in many parts of Ireland, as previously in India, as a skilled fisherman. He is survived by his widow and two brothers—Colonel F. C. Bigger, I.S.O., and Sir Edward Coey Bigger, M.D.

MANCHESTER HOSPITALS' DEBTS.—At the annual meeting of the Manchester Royal Eye Hospital it was stated that in four years the annual deficit on the Manchester hospitals had decreased from nearly £40,000 to just over £16,000. This decrease is said to be largely due to the allocations of the Hospital Saturday Fund, which in 1927 gave £14,486 to Manchester hospitals; in 1928, £28,507; and in 1929, £33,949. The accounts of the Eye Hospital for the year 1930 showed a deficit of £158.

CORRESPONDENCE

BURNING DURING ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—It is difficult to agree with the conclusion given on p. 305 of your issue of last week that the "responsibility of the anæsthetist . . . is prolonged into the bedroom where the patient lies still unconscious." There must be a time, clear-cut and definite, when his responsibility ceases, and I hold that it is when the administration comes to an end, and that there is no obligation on him even to see the patient back to bed, although he frequently or usually does so partly because his services are needed in place of those of a porter but chiefly because he follows an old custom which dates from the days of unskilled nursing. The anæsthetist does not select the nursing home, nor the nurse when the operation is in a private house, and he cannot logically be held responsible for her acts of commission or omission. He could not, for example, be held responsible for an abscess resulting from the use by the nurse of a dirty needle in giving an injection of atropine before the operation, although he would have to bear the blame if as a consequence of a carelessly written prescription or a lack of clearness in a telephone message the patient were to receive an overdose of morphine or other preliminary sedative. Again, I do not think that the anæsthetist has any power to give instructions to the nurse at the end of the administration, except at the request of the surgeon, who may consult him as a matter of courtesy or because some special method of anæsthesia or some new drug has been used with which the surgeon has small acquaintance.

If one looks at this question from the point of view of the nurse, one has to remember that she is to-day part of a team. She is not a Sairey Gamp, but a trained, skilled, and certificated individual, who considers herself, and rightly, responsible for the care of the patient both before and after operation, and resents any question or inquiry which might show lack of confidence in her care and ability. Reference to a standard book on nursing such as Ashdown will show that the importance of the preparation of an "operation bed," and the protection of the patient from a burn by a hot-water bottle are strongly emphasised, in fact it is there plainly stated that a burn resulting from its use is a disgrace to the nurse. Cuff and Pugh, too, state that nothing reflects greater discredit on a nurse than a burn produced by a hot-water bottle. There can be little doubt then that the nursing profession does not consider the anæsthetist responsible for these unfortunate accidents, but its own members.

I am, Sir, yours faithfully,

FRANCIS E. SHIPWAY.

York-terrace, Regent's Park, N.W., Feb. 8th, 1931.

To the Editor of THE LANCET.

SIR,—Last week you drew attention to an interesting legal case, but the question of responsibility of the surgeon and the anæsthetist was left somewhat vague. It is highly desirable that there should be some authoritative statement on this matter, in order that doctors may know their responsibility in the eyes of the law.

Let us consider the case of the patient in a nursing institution, unconscious as the result of anæsthesia or other cause. Full responsiblity for the nursing of the unconscious patient would be readily admitted and rightly undertaken by the nursing staff, and deviation from routine nursing treatment would be made only on the express directions of the doctor in charge of the case. That the doctors should search the bed for hot-water bottles is unthinkable and would be resented as an interference with nursing duties. When an unfortunate accident such as this occurs, it is due to a fault in the nursing service, and an attempt to saddle the doctors with the responsibility for a fault in a duty which is not theirs, is, I maintain, not justified.

It is not reasonable to suppose that a claim for damages for the result of such a nursing accident would succeed against a doctor whose patient was unconscious as the result of cerebral hæmorrhage, or against a motorist who had caused unconsciousness from concussion in a victim of a motor accident. As in the medical case, and in the accident case, so in the case of the unconscious patient recovering from the anæsthetic state, in which he has been placed by an anæsthetist in the course of his duty, the damage resulting from the burn would not have occurred but for the fault in the nursing service, and it is on that service that the responsibility should rest.

I am, Sir, yours faithfully,

Worthing, Feb. 9th, 1931. C. GIBSON.

THE LONDON CLINIC AND NURSING HOME.

To the Editor of THE LANCET.

SIR,—The building of the London Clinic is now nearing completion, and the executive committee of the medical advisory board consider that the time has come to explain its objects and ideals more fully and to give some details of the means by which it is hoped that they may be achieved.

It has long been realised both by the medical profession and by the lay public that the modern developments of medicine necessitate wider facilities for the investigation and treatment of disease than are at present available for the general public. There is probably no city in the world which presents such a contrast in the provision which it makes for illness as does the City of London. On the one hand, there are the voluntary hospitals, unrivalled as monuments of charity, where the poor have at their absolute disposal every resource that modern medicine can provide or surgery devise. On the other hand, those whose circumstances or whose pride remove them from the hospital class, have often to be satisfied with makeshift accommodation and are excluded from the resources in equipment and coördination which are the foundation of the work of our hospitals.

Modern specialist treatment can be carried out only in a building specially adapted for the investigation and treatment of disease, organised on modern lines, and provided with adequate laboratories and X ray equipment. The need for such a building containing rooms to suit all classes of paying patients is so obvious that one would have thought little difficulty would be experienced in finding the money for its erection. Yet this has taken 12 years of difficult negotiation to achieve. Faced with the dilemma that on the one hand there is a strong feeling against the financing of nursing homes by medical men, whilst on the other no financial group was prepared to take a financial risk which medical men refused to share, a solution agreeable to both parties was at last reached. A company was formed to put up a building consisting of a nursing home, for the finance of which the

company would be responsible; and a number of consulting rooms the lease of which the medical men might purchase without any breach of medical ethics. This arrangement assured the company of satisfactory medical support without involving medical men in financial responsibility for their affairs.

The building, which is rapidly approaching completion, is situated on the south side of Marylebone-road, bounded on the west by Devonshire-place, and on the east by Harley-street. Special care has been taken to protect the patients from noise and vibration. The steel uprights which support the building are embedded in a system of padding, which ensures a complete absence of all vibration. The patients' rooms face, not on the Marylebone-road, but on the south, south-east, and south-west frontages, where they enjoy a wide outlook and are entirely protected from noise. The building is so high that many of the rooms enjoy a view extending across London to the hills of Kent.

The building has been designed with the utmost care and in constant consultation with expert medical opinion. In order to obtain the very latest information on modern hospital equipment and organisation, a committee of the directors of the company and the members of the medical group visited all the most modern hospitals in Sweden, Denmark, Holland, and Paris, as well as others in France, Germany, and America, and we are convinced that this clinic will set an entirely new standard in design and equipment. A wide range of accommodation between small single rooms and private suites will meet the varying requirements of patients, but in every instance the standard of comfort will be the highest attainable, and special attention has been paid to those small amenities which mean so much when one is ill. The kitchens will be on the most modern lines, and in view of its increasing medical importance a special diet kitchen under expert control has been installed.

An outstanding feature is the provision made for maternity cases and for children. For the former a separate floor has been specially equipped, with arrangements which ensure absolute quiet and privacy, and a special nursing staff will be reserved exclusively for these patients. The children will be accommodated in a separate wing, so arranged that each child can, if necessary, be accompanied by its own family nurse, whilst a large solarium, opening directly on the south side of this wing, will give every possible opportunity for fresh air and sunshine.

As regards the staffing of the hospital two features will add greatly to the comfort of the patient: the nursing staff will be sufficiently large to supply special nurses—usually a costly item—at a very low charge; and there will be two resident medical officers who can be called upon at any moment of emergency. In regard to the latter it must be clearly understood that these resident medical officers will in no way usurp the authority of the patient's own medical adviser. It is an essential part of our conception that the patient should still remain in contact with his regular doctor, for we consider this of the utmost importance for the continuity of treatment. The building will thus be a large nursing home open to the medical profession of the whole country, equipped and staffed with all the resources of a modern hospital.

In addition, it is proposed to develop within the group of medical men who occupy the consulting rooms a plan of combined work, so that patients of moderate means may be saved the multiple consultations, involving so much expenditure of time and money, which often make the elucidation of their malady such a costly process. Such service of mutual assistance between the members of the staff is universal in our voluntary hospitals, and there is no single feature of their organisation which is of greater value to the patient. The development of such a service for those who are just outside the hospital clientele is by no means an easy matter, and will demand very careful consideration. We have no doubt, however, of the necessity for such a service, and its provision will be one of our earliest objects. By such a service, backed by rooms at the lowest charge which is economically possible, we shall effectively bridge the present gulf between the poor and the wealthy. We would, however, reiterate that this service, in common with all the other services of the clinic, is available to patients solely through their medical advisers. A wide experience has convinced us that to make use of specialists' services except in a consultative capacity is a definite disadvantage to the patient, whose interests are best served by the closest possible coöperation between those whom have charge of his health.

This is the first real effort in this country to extend the advantages of an organised specialist service to those who are excluded from the services of charity. It will provide suites of rooms offering a convenience and a comfort never before attempted, whilst more modest accommodation will be available at the lowest rates compatible with efficient treatment and service. The dreams of the group of medical men who are responsible for its initiation have only been brought to fruition by years of laborious effort. It is their earnest desire that this building should be freely open to the whole of their medical brethren, and that it should bring within the reach of patients of every class advantages which have not hitherto been generally available.

We are, Sir, yours faithfully,

H. MORELAND MCCREA (Chairman), W. ROWLEY BRISTOW, G. LENTHAL CHEATLE (Vice-Chairman), WALTER HOWARTH, A. P. BEDDARD, H. S. SOUTTAR, A. J. WALTON,

Executive Committee to the Medical Advisory Board.

Feb. 10th, 1931.

THE SOURCE OF PUERPERAL INFECTION.

To the Editor of THE LANCET.

SIR,—Your leading article of Jan. 31st (p. 250) strongly supports the work of those who believe in the exogenous source of puerperal infection. It is of interest therefore to raise the following matter at this point.

The source of such infection, it is suggested, is the throat of the attendant or of those in contact with the patient; and even when the carrier is engaged in swabbing the vulva with an antiseptic, the streptococcus can yet establish itself, as was recorded in the Sheffield series of cases. Yet there are many surgeons who still open an abdomen without wearing a mask, and still many more who do not require all those entering the theatre to wear one; yet nothing untoward is observed in the subsequent course of these numerous laparotomies which could be attributed to infection from the unguarded throat of someone in the theatre.

Why then the extraordinary susceptibility of the post-partum uterus? A possible suggestion is that in no other condition is there the requisite pabulum of blood under such ideal cultural conditions as exist in such a uterus. To decide this point it would be of interest, therefore, to know the incidence of puerperal sepsis in cases where (1) it is known that no vaginal examination at all has been made, as in the

case of dwarfs and gross deformity, and Cæsarean section has been performed, and (2) cases in which (*a*) similar conditions have been observed, (*b*) numerous examinations have been made, both (*a*) and (*b*) being followed by Cæsaran section and hysterectomy.

If it could be thus shown that the incidence of such infection were negligible in amount under group (2) and particularly under (*b*) there would be a strong presumption that the absence of the large quantity of blood must be a factor. Whilst admitting that the absence of the large absorbing surface of the endometrium must be discounted under group (2) I believe that such information would still be of value in elucidating the factors concerned with the pressing problem of puerperal sepsis.

I am, Sir, yours faithfully,

BERNARD SANDLER, M.B., Ch.B.,
Manchester Victoria Memorial Jewish Hospital,
Feb. 8th, 1931. Cheetham.

THE QUALITY OF PANEL SERVICE.

To the Editor of THE LANCET.

SIR,—As a panel practitioner I entirely agree with Dr. Fenwick that national health prescribing is definitely restricted. Irritating interviews to explain apparent over-prescribing, and frequent notices from insurance committees of prescribing being above the area average, result in a measure of economy which produces restriction. The withholding of such comforts as liniments, lincti, inhalations, &c., may make little difference to the end of an illness, and may result in satisfying the economists; but the patient endures more distress than he need have done.

I am, Sir, yours faithfully,

M. DE LACEY, M.B., B.S.
Sheerness, Kent, Feb. 6th, 1931.

VARIOLA MINOR.

To the Editor of THE LANCET.

SIR,—I regret to learn from your leading article last week, entitled the Small-pox Hospital, that "few medical officers of health who have had experience of the current type of small-pox are now greatly concerned when it is notified to them," and that the same measures are not taken to control the disease as are taken in variola major. Later you state that if cross infection occurred in the wards of a fever hospital it would not be a matter of much consequence.

Personally I feel that medical officers of health should make as great efforts in combating this disease as variola major. If they do so, it is probable that the long continued spread will be stopped and the disease extirpated. No doubt the disease is relatively mild, with a negligible mortality and a relatively low infective power, but many persons attacked suffer severely. The point I wish to emphasise, and with which I have no doubt you agree, is that seeing it is possible to banish this disease, no effort should be spared in controlling its spread. If medical officers of health, general practitioners, and laymen once assume that variola minor may be lightly regarded, then there is a likelihood that the disease may become endemic, which would be a reproach to the health service of this country.

It is the fear that your editorial may unintentionally lead to laxness that compels me to write this note.

I am, Sir, yours faithfully,

DUNCAN FORBES,
Feb. 9th, 1931. Medical Officer of Health, Brighton.

MASTOIDITIS IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Since the question of the frequency of otitis media and mastoiditis as a complication of diphtheria has been raised by Dr. Underwood, perhaps the following observations may prove of interest to some. During the last ten weeks 100 cases of diphtheria have been under treatment in this hospital, and otitis media has occurred in no less than six. In four of the cases the inflammation of the ear was bilateral. In five of the six cases the diphtheria was of a very severe faucial type, one case proving fatal on the seventh day of illness. In the sixth case the larynx only was affected. Diagnosis was in all cases confirmed by examination of cultures from the throat. Staphylococci, streptococci, and diphtheroid organisms were recovered from the aural discharge, but never an organism which qualified as a true diphtheria bacillus.

Mastoiditis occurred in one of the cases, the history of which is shortly as follows:—

A boy, 2½ years of age, had been unwell for four days before admission on Nov. 22nd, when he was very ill; the face had that extreme pallor characteristic of diphtheritic intoxication, and the circulation was obviously failing. Membrane was present in considerable amount on both tonsils, and on the posterior pharyngeal wall. He received 100,000 antitoxin units at a single dose. On Dec. 6th, although he still suffered from circulatory disturbance, and had developed some degree of palatal paralysis, his general condition was much better. But a slight rise in temperature led to examination of the ears, when the left drumhead was found to be red and bulging. Paracentesis was performed, and a copious purulent discharge followed. He continued to improve slowly until Dec. 17th, when paracentesis of the right drum had to be performed. Discharge from both ears persisted, and on Feb. 1st the temperature and pulse-rate rose. Next day there was a tender swelling over the right mastoid process, and that night a Schwartze operation was performed by Dr. R. P. Mathers. Pus was found in the antrum and in other cells. The boy is making a good recovery.

The part played by the diphtheria bacillus in these infections is difficult to assess. Most of my cases have been in ill-nourished children of the poorest class, who have been further debilitated by a severe attack of diphtheria. Possibly the bacterial cause of the otitis is organisms which are only what has been described as "opportunists in pathogenicity."

I am Sir, yours faithfully,

A. A. DOUGLAS,
Senior Medical Officer, King's Cross
Feb. 7th, 1931. Hospital, Dundee.

PREGNANCY AND TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—The judicial annotation on this subject in your issue of Jan. 31st (p. 251) is difficult to criticise, but having observed the course of numerous pregnancies in tuberculous women I should like strongly to side with those who would leave the pregnancy severely alone. Admitting that 50 per cent. of women with active tuberculosis are made worse by child-bearing, there are still a number that are unaffected and an appreciable percentage—19 from my own figures—who are improved. No evidence has yet been adduced that patients whose pregnancy has been interrupted fare better than the rest.

Regarding those patients that you specially mention, in whom the clinical onset of disease is first noted in pregnancy or after parturition, it is usually after the event, when there is no question of interruption, that the disease is diagnosed. As happens in other directions our judgment is hampered by statements

repeated in text-books and by Dubois's oft-quoted aphorism: "If a woman threatened with phthisis marries she may bear the first accouchement well, a second with difficulty, a third never."

An important aspect of the question with which you did not deal is the number of the children of tuberculous mothers who become in their turn tuberculous, and this alone is enough to render essential the teaching of some efficient method of contraception.

I am, Sir, yours faithfully,

Paignton, Feb. 3rd. 1931. ERNEST WARD.

THE NATURE OF MINERS' NYSTAGMUS.

To the Editor of THE LANCET.

SIR,—Your leading article of Jan. 10th (p. 87) points out that in the occupational neuroses the prominent symptom is "an excrescence upon an underlying mental state." The subjects of miners' nystagmus are still taught that the eye condition is the "cause" of the mental state, which then becomes hopeless and certainly receives no understanding from our profession.

This letter is prompted by a report of an inquest in the *Birmingham Post* of Jan. 22nd with the alarmist headlines: "Miner Who Dreaded Nystagmus. Cause of a Pelsall Man's Suicide." The medical evidence stated that nystagmus gave rise to neurasthenia, and, when serious, it almost without exception affected the mentality of the man contracting it. Is there any other disease that behaves in this mysterious fashion? The whole hypothesis comes down from the days before, as your leader put it, mechanistic views had been modified by a knowledge of psychopathology. It amounts to telling psychoneurotic people that their troubles are due to a disease for which there is no remedy and no hope of anything except compensation. So long as this teaching remains orthodox we must expect the disease to increase and to be followed by more and more suicides.

Whatever may be the meaning of the oscillation, the disabling symptoms are always psychoneurotic, and it is full time for us to recognise the mess we have got into by ignoring this fact. It is time too that we faced this bogy of neurasthenia and asked ourselves what we mean when we talk about it. As it is, we have a symptom with no known pathology mysteriously causing a disease, likewise with no known pathology, the very name of which is becoming an object of contempt because of the cover it offers to untidy thinking.

I am, Sir, yours faithfully,

Portsmouth, Feb. 5th, 1931. W. S. INMAN.

SEX DETERMINATION.

To the Editor of THE LANCET.

SIR,—With reference to Major Williamson's letter in your last issue, I can add two cases of childbirth in which the date of conception was known to the three he quotes. In the first case, a boy, conception occurred 13 days after the beginning of a period. In the second case, a girl, conception occurred 20 days after the beginning of the last period. The two were two successive pregnancies in the same woman. In the case of the boy the gestation time was 277 days, in the case of the girl it was 268 days. It would be interesting to know whether other observers have found any marked difference in the gestation time in the two sexes.

I am, Sir, yours faithfully,

ALICE I. ROUGHTON, M.R.C.S., L.R.C.P.

Cambridge, Feb. 9th, 1931.

PANEL AND CONTRACT PRACTICE

The Panel Patient on Holiday.

THE Cornwall Insurance Committee has refused to refund the sum of two guineas paid by a London bank clerk to a doctor whom he called in when on holiday in Cornwall. Although insured under the N.H.I. Acts, this patient asked the amount of the doctor's fees and paid it by drawing a cheque in a book which he had under his pillow. He gave no indication whatever that he was an insured person and desired to be treated as such; on returning to London, however, he claimed a refund. The medical service subcommittee is, however, determined to put an end to this practice of insured holiday-makers receiving treatment as private patients by misleading the insurance practitioner. Dr. W. Leslie was able to strengthen the committee in its decision by telling them that there were more cases of this sort in the county than came before them. It seemed to be the idea of the Londoner that he would get better attention as a private than as an insured patient; on behalf of the medical profession he rebutted this idea. On the other hand it was annoying to a medical man, after attending a person for a considerable time and sending in an account, to be told "I am on the panel." In a great number of cases the doctor said nothing and withdrew his account; but this case was too flagrant. The name of the man who purposely withheld the information that he was an insured person is not given in the press report. This is one of the cases, we think, in which a little publicity might be useful.

Changing the Doctor.

At a meeting of the Brighton Insurance Committee held on Jan. 22nd, a proposal to amend the medical benefit regulations, so as to require an insured person to give not less than one month's notice of his desire to change his doctor, came up for discussion. It was reported that the Middlesex Insurance Committee favoured the proposal, while the Barrow Insurance Committee thought that no change was necessary. The Brighton committee resolved unanimously to adhere to the principle of the right of an insured person to change his doctor at any time and without formality, Dr. E. F. Fothergill remarking that the suggested change was quite contrary to the wishes of the medical profession. At a meeting of the Bristol Insurance Committee held on Feb. 2nd it was unanimously decided that insurance practice should conform as closely as possible to private practice, and that no further limitation or restriction of the rights of insured persons to change their insurance practitioner was necessary or expedient. The Coventry Insurance Committee also adopted a similar recommendation of its medical benefit subcommittee, with a remark that the existing interposition of a fortnight's delay before deciding to effect a change is efficacious in checking transfers.

OBITUARY

ALEXANDER G. R. FOULERTON, O.B.E., F.R.C.S. Eng.,

CONSULTING MEDICAL OFFICER OF HEALTH, EAST SUSSEX.

Alexander Grant Russell Foulerton, who died after only a few days illness on Monday, Feb. 2nd, was born at Exeter in 1863, being the eldest son of Capt. Alexander Foulerton of the Indian Navy. He received his general education at the Kensington School and joined the medical school of St. Bartholomew's Hospital taking the English double qualifications in 1885. He filled residential appointments of various sorts and obtained the F.C.S. and the D.P.H. Camb. in 1893 and the F.R.C.S. in 1895, by which time he had become deeply interested in the comparatively new science of bacteriology, which he studied at St. George's Hospital. He was appointed assistant bacteriologist and gave lectures on Hygiene at the British Institute of Preventive Medicine (now the Lister Institute) during 1897-98. During that time and subsequently he worked at the pathological changes produced in animals by inoculation of various species of Blastomyces, especially *Saccharomyces tumefaciens*. These researches were published in the *Journal of Pathology and Bacteriology* in 1900, after he had become Director of the Public Health and Clinical Laboratories at the Middlesex Hospital. He also made a long and careful study of the different species of streptothrix and the part which they played in human infections. He wrote the article on this subject in Allbutt and Rolleston's System, and in his Milroy lectures delivered before the Royal College of Physicians of London, in 1910, he expressed his views, developed during the investigation of 53 cases from which he obtained cultures, and recorded 25 further cases in 1913 in THE LANCET, i., 381. This study led him to the opinion that human infections with streptothrix were not rarely erroneously diagnosed as tuberculosis on account of the resemblance of the two micro-organisms in the sputum and other discharges. As evidence of this he cited 14 human cases which were considered during life as tuberculous disease of the lungs, but from which he isolated a streptothrix, and whose infection he believed to be due to this organism and not to *B. tuberculosis*. He also stressed the close affinity of these two organisms. His views on human streptothricoses have not been generally accepted, but the recent work by Dr. H. H. Scott has shown how closely the two infections may be associated in some lower animals.

MR. ALEXANDER FOULERTON.

Photograph by Elliott & Fry.

In 1899, having been for a time pathologist and bacteriologist to the Chelsea Hospital for Women, he was appointed lecturer on public health and bacteriologist at the Middlesex Hospital, where he did much enthusiastic work under considerable difficulties arising mainly out of the circumstances of the time. For when Foulerton was imported to the Middlesex Hospital, the official relations of a bacteriologist to the general pathological department of the big institutions were not defined, and the establishment of a proper organisation was hardly recognised at the Middlesex which in this respect resembled many of the other big teaching schools at that date. Foulerton's work, which was not always assisted by a certain combative spirit, was strenuous; he was unsparing of himself as his contemporaries at Middlesex remember; he was always willing to help others, and to his fixity of purpose and organising capacity Middlesex owed the conception of the pathological department now established by the generosity of Sir John Bland-Sutton. For four years, from 1900 to 1904, Foulerton was in charge of the Cancer Research Laboratory at Middlesex Hospital when Dr. Lazarus-Barlow became Director of the Department. During part of this period he was demonstrator of biological chemistry at the Lister Institute, while in 1902 he added to his responsibilities the duties of assistant and, later, chief medical officer to the East Sussex County Council, and also those of lecturer on public health at University College, London, and at the London School of Medicine for Women.

For 26 years—namely, until his retirement in April, 1928—Foulerton was actively engaged in the public health work of East Sussex, and the following estimate of the way in which he discharged his duties has been confided to us by certain of his late colleagues: "The period of expansion in growth of the work of a County Public Health Department during the last 25 years provided ample scope for the fine administrative ability which proved to be such a marked characteristic of Mr. Foulerton. He was responsible for the origination and development of most of the important schemes which form the foundation of the present activities of the Department. He carried them through their difficult stages and finally had the satisfaction of witnessing the success brought about by his untiring efforts. He was an extremely active worker. He used to sleep but five hours and rise early to work. He never spared himself in the carrying out of his duties, but though he seemed to be completely wrapped up in them he had a wide range of interests, literary, historical, and naval. The sound judgment always shown in the advice he gave in all details of the work will long be appreciated by those with whom he was in contact. His quick brain made him impatient of those who were slow to grasp what was clear in a flash to him and he was short with people who seemed to be making difficulties or profferring ill-founded accusations. His loyalty towards his fellow-workers will never be forgotten by those who had the privilege of being associated with him in the work of the Department. He never complained of work being ill-done. His effective rebuke was to do it himself and to mention the fact casually." In 1928 he retired with the post of honorary consulting medical officer.

Foulerton joined the R.A.M.C. shortly after the outbreak of war, and in November, 1915, proceeded to France, and shortly afterwards took over charge of the Chemical and Hygiene Laboratory at Boulogne, where all food and other analyses in connexion with the Army in France were carried out. He took a share in the numerous researches into the occurrence of gas-gangrene, and advocated perborate to hinder anaerobic infections. In April, 1917, he was sent home to take charge of the Hygiene Department of the R.A.M. College, which by then, had been moved to the University College Hospital, and he remained as such until demobilised in April, 1919. From the R.A.M. College come the following reminiscent words: "Foulerton was a man of very quiet personality with a charming character. As a teacher, and in charge of the Hygiene Department of the R.A.M.C., he had a great influence on his fellow workers, and his extensive knowledge of bacteriology and hygiene was most valuable and of great assistance to the Hygiene Department of the Army at a very critical period." He was made an Officer of the British Empire in recognition of his valuable services to the Army.

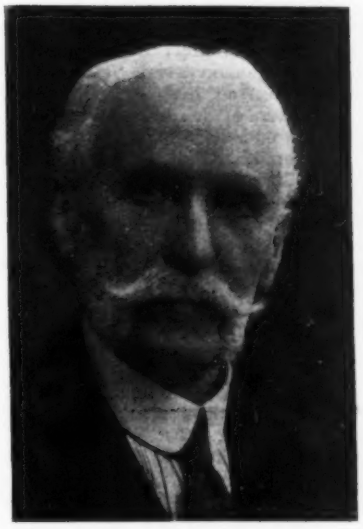
Foulerton's contributions to literature were always of practical value. In addition to the papers already mentioned, he made in the *Journal of Pathology and Bacteriology*, in 1921, some informing observations on arsenobenzol in acute yellow atrophy of the liver; in THE LANCET he wrote at different times on the pathology of glanders and on chemical preservatives in food; and in the *Journal of Pathology and Bacteriology* he made an inquiry into the infection of wild London rats with *Spirochæta icterohæmorrhagiæ*.

To one other of Foulerton's activities particular attention must be drawn, and that is his work as financial secretary to the London and Counties Medical Protection Society. The Society was formed in 1892, and Foulerton became a member that year, and in 1893 was appointed one of the honorary auditors, some 12 years later becoming financial secretary. Dr. Fegen, chairman of the Society writes: "I have been intimately acquainted with Foulerton for practically the whole of the time the Society has been in existence, and he had the interests of the profession at heart to such an extent that he devoted a tremendous amount of time to the work of the Society. His advice, particularly on financial matters, was always sound, the financial condition of the Society being evidence of the care that he has taken in regard to everything relating to its economical working. Except for a period during the war, he was continually in touch with our business. The Society has lost a very valuable officer, the Council a colleague who could be ill-spared, and all members of the medical profession one ever ready with friendship and practical assistance."

Sir GARROD THOMAS, M.D. Edin., LL.D. Wales.

Sir Garrod Thomas, who died at his home in Newport on Feb. 6th, was founder of the Royal Gwent Hospital, and perhaps the best-known and best-loved citizen of that town.

Abraham Garrod Thomas was born on April 5th, 1853, at Panteryrod, a Cardiganshire farm near Aberayron, the youngest of the five sons of Lewis Thomas. There was enough to eat although nothing to spare on the farm, and the cadet, after his schooling at Milford Haven, could not have entered a profession unless the opportunity had arisen of becoming apprenticed to Dr. George Griffith, of Milford. Three years later, at the age of 18, he went to Edinburgh University and began an academic career of brilliance, taking honours in every subject, and the highest distinction in midwifery and medicine. After graduating in 1876 he spent some time at St. Bartholomew's Hospital, London, and visited special clinics in Berlin and Vienna before returning to settle in Newport in 1877. In the following year he took his M.D. Edin. and built up a large general practice from which he retired in 1912. At the time of his qualification the only hospital in Newport was the Infirmary, regarded as a hotbed of sepsis by one who had recently come from Edinburgh with Listerian notions. Thomas, who succeeded Dr. Benjamin Davies as honorary physician to the infirmary in 1895, did not rest until a new hospital, named according to his wish, was opened on a new site in Cardiff-road in the year 1901, £5000 of the money having been contributed by his wife and himself. Three years later, on the death of Mr. Edwin Webber, he succeeded to the chairmanship of the hospital, which he held until his death. Last May he was presented with his portrait bust in bronze by Mr. L. S. Merrifield, in order that the hospital might have a permanent memorial (as the legend put it) of what the sick and injured owed to his inspiration, labours, and gifts.



SIR GARROD THOMAS.

But Thomas's medical activities were only a small part of the way in which he construed his citizenship. He was a member of the Newport town council from 1889 to 1897, retiring short of the mayoralty on account of pressure of professional work. He was a member of the Newport school board for three years, and after retiring remained a governor of the intermediate schools. In the University of Wales he was a member of the court of governors, and of the council of the University College of South Wales and Monmouthshire, and junior vice-president of the University College of Aberystwyth. He was justice of the peace for the counties of Cardigan and Monmouth, a deputy lieutenant for Monmouthshire, and for a time high sheriff of Cardiganshire. A lifelong Liberal, he was often approached to stand for the constituency, and succeeded to Lord Treowen's seat in the House of Commons for a brief period before the general election of 1918. He was knighted in 1912. In religion he was attached to the Congregationalist body, and for many years an honorary deacon of the Victoria-road Church. In paying testimony to his life an old friend, the Rev. A. W. Anderson, said that Sir Garrod had been to him a standing illustration of the fact that honest doubt only strengthened a man's real faith; the epitaph which he suggested for his own tombstone was:

"That in me which questions is reconciled with that which kneels."

Sir Garrod was active in many spheres of business life. He was one of the original directors of the *South Wales Argus*, of which he became chief proprietor, and he ensured its remaining an independent paper to the day of his death. He was chairman of the Welsh Insurance Corporation and the Emlyn Anthracite Collieries, as well as of a number of public utility services. His only recreation was travel, and he was on the *Delhi* with his wife and daughter in December, 1911, when the vessel was wrecked on the coast of Morocco. He broke both bones of the right leg above the ankle, and although he did not reach shore for 48 hours, and then had to travel 15 miles by mule to Tangier, he made a perfect recovery and paid a prolonged visit to Algiers.

Sir Garrod married in 1879 Eleanor Richards, a daughter of his own shire, and her sudden death at the end of 1926 was a blow from which he never recovered. Although he made light of his growing disabilities—he called his rheumatism "poor man's gout"—his friends noticed the gradual failure of his powers, but he retained a cheerful and courageous activity to the last.

He leaves a son and two daughters.

GEORGE EDMONDSON BIRKETT, *M.C.*, B.A. Camb., M.R.C.S. Eng.

NEWS of the death of Dr. G. E. Birkett, director of the Manchester and District Radium Institute, on Feb. 5th, after a very acute and short illness, came as a shock to his many friends. He was son of George Birkett, of Morecambe, where he was born on Nov. 26th, 1893, and was educated at Lancaster Grammar School and Trinity Hall, Cambridge, graduating in 1915. He served as surgeon probationer in the navy until he received his orders to qualify in medicine, when he joined the Manchester medical school and took the M.R.C.S. in 1917. He joined the R.A.M.C. and was sent to France, but in September, 1918, whilst rescuing a wounded man, he received a bullet wound in the spine injuring the cauda equina. For this act of bravery he was awarded the Military Cross. After a preliminary operation to remove pressure on the spinal nerves he was sent to St. Thomas's Hospital, where he spent 14 months. Although sufficiently restored to return to Manchester and act as house physician he was obliged to wear an artificial appliance to enable him to walk at all, and remained subject to severe neuralgic pains. He became demonstrator in pathology in the University of Manchester and its registrar at the Royal Infirmary in 1921. Three years later he was offered the post of pathologist to the Radium Institute, finding the work so congenial that in 1925, when the director was given leave of absence owing to ill-health, he took over his duties, and continued in charge until 1930, when arrangements were made so that he could take rooms and practise as a radium consultant. His advice was widely sought, and he was appointed consultant in the radium treatment of cancer to the hospital staffs of Chester, Wrexham, and Bangor, and a member of the advisory committee of Mount Vernon Hospital.

Birkett was an excellent teacher both for students and practitioners. He was thoroughly conversant with the physics of radium and had clear and definite ideas of its therapeutic uses and limits. He kept himself well informed of the work of continental institutes by periodic visits to them. He was a member of the Manchester Committee on Cancer and of its joint committee on research with the University which was concerned chiefly with the causation of mule-spinner's cancer; at the Radium Institute he saw many cases of epithelioma of skin occurring in operatives working in the local spinning mills. He wrote on several aspects of his work, one of his most important papers dealing with the changes met with in the blood of radium workers. His best known work was done on cancer of the mouth and tongue; an article which he published three years ago in our own columns set out quite simply the remarkable results which he had then obtained, brought carefully into relation with microscopical appearances. His monograph on "Radium Therapy, its Principles and Practice," was just completed when his health finally failed. Naturally he played a prominent part in making arrangements for the use of radium allotted to Manchester by the Radium Commission, and had just begun to treat cases of cancer in the beds in the Royal Infirmary which were allotted as an essential part of the scheme.

DR. BIRKETT.

Prof. G. E. Gask writes: "The country owes much to Dr. Birkett for the interest and enthusiasm he showed in the treatment of malignant disease by radium, and especially in the treatment of epithelioma of the tongue by radium. It is largely owing to his work that surgeons in this country were convinced that there was something in this form of treatment. Those who were sufficiently interested to make a journey to Manchester and visit the Radium Institute were able to see for themselves large numbers of patients who had had epithelioma of the tongue which had been treated by radium and which had disappeared. This work began in quite a small way when the Medical Research Council loaned a certain amount of radium for the purposes of research to Manchester. This work was conducted by Birkett, and it developed slowly from a department containing only a few patients to a very large concern. It was recognised by the Radium Commission as one of the most important in the country. This is all the more interesting when one remembers that Dr. Birkett suffered from a gunshot wound of the spine during the war, which left him permanently partially disabled. In spite of his disability he continued to work with an enthusiasm which was most inspiring, and kept one in almost reverent admiration. His early death is greatly to be regretted, not only on account of his charming personality, but

on account of the loss to the research in the treatment of cancer by radium." And one of his Manchester colleagues adds: "The outstanding impression which Birkett's personality must leave on all who were associated with him, was that of indomitable courage. He never took the easy way, nor spared himself in the effort to achieve a high scientific standard, and to ensure for his patients the best attainable result. As in his work, so in his play; one has a vivid recollection of his pride in a round of golf over a difficult course, with a score which few of his physically sound colleagues could emulate."

Dr. Birkett married Miss May Thomas, daughter of the late Major A. W. Thomas, R.E., of Ayton. She survives him with two children.

MEDICAL NEWS

University of Cambridge.

On Feb. 7th the following degrees were conferred:—

M.D.—S. D. Sturton (by proxy).
M.B. and B.Chir.—W. G. Oakley and T. C. Stevenson.
M.B.—A. W. Williams.

Royal Colleges of Physicians and Surgeons of England.

At the Final Examination of the Conjoint Board, held from Jan. 12th to Feb. 4th, the following candidates were approved in the undermentioned subjects, but have not completed the whole of the Final Examination entitling them to diplomas:—

Pathology.—M. W. Allen, Middlesex; F. C. Angior, Liverpool; Marjory Archer, Westminster; A. Ascher, King's Coll.; Margaret M. Baddeley, Liverpool; J. S. Batchelor, Guy's; T. E. Burrows, Cambridge and St. Bart.'s; H. G. H. Butcher, Cambridge and Manchester; W. I. Card, St. Thomas's; G. N. Carrell, Guy's; L. P. B. Chamberlain, St. Bart.'s; I. Cohen, King's Coll.; C. P. Collins, Univ. Coll.; R. A. F. Creet, St. Thomas's; J. F. Dales, Univ. Coll.; T. F. Davies, Guy's; N. E. D. De Silva, Univ. Coll.; H. Edwards, Guy's; L. P. J. Evans, Cambridge and St. Bart.'s; S. G. French, King's Coll.; S. Goide, Charing Cross; I. Gold and H. Goldenberg, London; A. J. B. Goldsmith, Middlesex; D. G. Gower, Cambridge and Westminster; Hilary S. M. Hadaway, Royal Free; H. T. Halper, St. Bart.'s; O. C. Hamilton-Jones, Liverpool; F. Hilmy, Durham; C. B. Hinkley, St. Thomas's; J. Howell, Guy's; J. A. James, Wales and Charing Cross; D. E. V. Jones, King's Coll.; A. Kahan, St. Thomas's; C. A. Keane, St. Bart.'s; M. M. Landau, Middlesex; R. C. Langford, Cambridge and St. Thomas's; A. M. P. Laurent, Univ. Coll.; A. D. Low and J. M. Low, St. Mary's; G. A. M. Madel, Middlesex; M. T. Maung, Rangoon; I. D. Monger, Charing Cross; A. K. Monro, Cambridge and London; L. G. Norman, Univ. Coll.; C. V. Oldroyd, Manchester; H. Owen, St. Mary's; R. McI. Paton, St. Thomas's; G. F. Petty, St. Bart.'s; D. R. Prem, King's Coll.; G. R. C. Rayner, Guy's; L. Rees, St. Thomas's; J. Reeve, Westminster; G. O. S. Reid, St. Mary's; W. F. Richards, Cambridge and St. Bart.'s; P. Rosenfeld, St. Bart.'s; I. N. Samuel, Middlesex; P. G. Scott, St. Bart.'s; J. W. V. Sheldon, Guy's; H. Simmons, St. Bart.'s; H. M. Singer, King's Coll.; R. G. W. Southern, St. Thomas's; H. W. G. Staunton, St. Bart.'s; Joan W. Stelfox and J. L. Treneman, Liverpool; A. B. Waters, Cambridge and St. Bart.'s; Evelyn A. M. White, Univ. Coll.; R. G. Wilbond, Bristol; E. W. Wilkins, Birmingham; Eva M. M. Willett, Westminster; D. I. A. Williams, Liverpool; A. L. Wingfield, St. Thomas's; and C. E. R. Wood, Cambridge and Guy's.

Medicine.—Doris Ascough, Manchester; P. S. Bassalvi, M.B. Punjab, Middlesex; R. J. V. Battle, Cambridge and St. Thomas's; A. J. W. Beard, St. Bart.'s; E. H. S. Bebb, London; Jessie G. Belilios, King's Coll.; D. R. Bharucha, M.B. Bombay, St. Bart.'s; H. G. H. Butcher, Cambridge and Manchester; G. T. Cook, Cambridge and King's Coll.; K. M. Cooper, M.B. Bombay, Royal Free; J. H. Ferguson, Cape, Oxford and King's Coll.; T. N. Gledhill, Oxford and Westminster; J. T. Griffiths, Univ. Coll.; A. E. T. Hart, Cambridge and St. Thomas's; B. T. W. Harvey, London; A. C. Hauptfleisch, Cape and Guy's; J. M. Holmes, Leeds; F. J. V. Jaensch, St. Bart.'s; N. M. James, King's Coll.; C. A. Keane, St. Bart.'s; H. de B. Kempthorne, Oxford and St. Thomas's; Madeline E. E. Knowlson, Westminster; J. S. Knox, St. Bart.'s; R. C. Langford, Cambridge and St. Thomas's; J. J. H. Lowe, Durham; Sosa Matthew, M.B. Punjab, Royal Free; S. G. Meanley, Leeds; A. K. Monro, Cambridge and London; W. J. Morris, Liverpool; B. S. Nanjiani, M.B. Bombay, Bombay; G. H. Newns, King's Coll.; T. F. B. Noble, London; J. E. A. O'Connell, St. Bart.'s; Catherine O'Connor, Manchester; H. J. O'Loughlin, M.B. Vict., Manchester; H. A. Phillips, M.D. Melb., Melbourne; W. M. Priest, Univ. Coll.; A. G. Sanders, St. Thomas's; P. C. Sanyal, M.B. Calcutta, Middlesex; K. S. Southam, Guy's; F. R. Staub, Leeds; N. S. Taggart, Manchester; Marion E. Townsend, Royal Free; Eva M. M. Willett, Westminster; and C. Wilson, London.

Surgery.—R. Ahmad, Punjab and London; E. Anfilogoff, London; P. T. Ashby, Cambridge and London; R. Baker, Leeds; J. S. Barker, Cambridge and St. Thomas's; G. Barwell and J. S. Batchelor, Guy's; A. S. Baxi, Punjab and London; W. D. Bell, Cambridge and St. Bart.'s; W. A. C. K. N. Bruce, Cambridge and St. Thomas's; A. H. Bulleid, Cambridge and London; P. H. Charlton, Middlesex; S. Cimmering, St. Bart.'s; E. F. Claridge, London; H. W. Cowen, Cambridge and Univ. Coll.; E. J. Currant, Cambridge and London; H. L. N. Davies, Birmingham; J. O. F. Davies, Middlesex; C. J. N. Davis, Bristol; W. De Lacey, London; E. StJ. C. Emerson, St. Mary's; G. A. Emmerson, Cambridge and St. Mary's; D. Erskine, Guy's; J. H. Ferguson, Oxford and King's Coll.; B. Fine, London; J. Finer, Middlesex; A. C. Frazer, St. Mary's; J. W. O. Freeth, St. Bart.'s; V. Glass, Univ. Coll.; T. N. Gledhill, Oxford and Westminster; P. W. Godfrey, Leeds; S. E. Godwin, St. Bart.'s; E. A. Gudgeon, St. George's; H. F. Green, Cambridge and St. Bart.'s; Hilary S. M. Hadaway, Royal Free; A. E. T. Hart, Cambridge and St. Thomas's; K. Hazell, King's Coll.; C. B. Hinkley, St. Thomas's; E. T. Hudson, Manchester and Charing Cross; J. H. Hunt, Oxford and St. Bart.'s; C. D. P. Jones, Univ. Coll.; I. O. Jones, Guy's; A. Kahan, St. Thomas's; D. H. Klugman and G. F. Lashmore, Guy's; D. L. Lewis, Cambridge and St. George's; J. W. S. H. Lindahl, Cambridge and St. Thomas's; A. B. MacEwan, Cambridge and London; J. W. McLaren, Cambridge and St. Thomas's; Halle Marsten, Charing Cross; M. H. Masina, Cambridge and St. Bart.'s; W. H. Mason, Middlesex; J. M. Matthew, Cambridge and King's Coll.; H. K. G. Nash, Cambridge and Middlesex; W. McN. Niblock and R. Palmer, Cambridge and King's Coll.; J. L. Parker and W. R. Parkes, Cambridge and St. Thomas's; R. McI. Paton, St. Thomas's; H. A. Phillips, M.D. Melb., Melbourne; D. R. Prem, Bombay and King's Coll.; L. Rees, St. Thomas's; G. F. Rees-Jones, Univ. Coll.; R. V. C. Richards, Bristol; J. C. Roberts, St. Bart.'s; R. S. Sandhu, M.B. Punjab, Lahore; E. M. Sastry, Andhra; J. Scholefield, Leeds; A. Segil, Guy's; J. H. Shakespeare, Cambridge and St. George's; Eileen M. M. Shaw, L.M.S.S.A. Lond., Westminster; H. Singh, M.B. Punjab, and D. A. Smith, St. Bart.'s; R. E. G. Smith, Birmingham; J. H. Spence, Cambridge and St. Thomas's; Violet Spiller, M.D. Geneva, Royal Free; T. C. Stamp, Cambridge and St. Bart.'s; J. T. C. Taylor, St. Bart.'s; H. S. Tibbits, Cambridge and Birmingham; W. F. Townsend-Coles, London; D. S. Valentine, St. Thomas's; E. D. Ward, Cambridge and St. Thomas's; G. Wells, St. Bart.'s; J. C. Wharton, Guy's; Evelyn A. M. White, Univ. Coll.; R. B. D. Wright, St. Mary's; and J. Zeitlin, London.

Midwifery.—M. W. Allen, Middlesex; E. R. Andrews, Univ. Coll.; E. Anfilogoff, London; G. Ashton, Univ. Coll.; H. C. Bamford, St. Bart.'s; S. J. Belligard, St. Mary's; E. A. R. Berkley and W. H. Bradbeer, Guy's; Eleanor H. Brooks, M.B. Punjab, Royal Free; W. A. C. K. N. Bruce, Cambridge and St. Thomas's; T. E. Burrows, Cambridge and St. Bart.'s; H. G. H. Butcher, Cambridge and Manchester; W. I. Card, St. Thomas's; G. N. Carrell, Guy's; E. F. Claridge, London; Barbara G. C. Clarke, R. C. Cohen, and C. P. Collins, Univ. Coll.; H. A. Constable, Guy's; A. B. Cook, St. Bart.'s; R. A. F. Creet, St. Thomas's; G. J. Cunningham, St. Bart.'s; J. F. Dales, Univ. Coll.; H. W. D'Arcy, Middlesex; C. J. N. Davis, Bristol; N. E. D. De Silva, Univ. Coll.; T. H. Dias, King's Coll.; P. A. Diemer, St. Mary's; L. Freeman, St. Bart.'s; S. G. French, King's Coll.; M. J. Garber, Guy's; N. A. Gillespie, Oxford and London; J. H. L. Gilmore, Cambridge and St. Thomas's; S. Goide, Charing Cross; I. Gold, London; A. J. B. Goldsmith, Middlesex; W. H. Greany, Oxford and Guy's; H. F. Green and L. E. Green, St. Bart.'s; G. W. Hall-Smith, Cambridge and Guy's; B. T. W. Harvey, London; Florence D. Hawes, Royal Free; C. L. Hay-Shunker, St. Bart.'s; N. Heath, Westminster; W. N. Hine, Middlesex; L. A. Hiscock, St. Bart.'s; P. A. Hubbard, Univ. Coll.; S. V. Humphries, Cambridge and St. Thomas's; J. H. Hunt, Oxford and St. Bart.'s; S. S. Jaikaran, Cambridge and St. Thomas's; J. E. Jenkyn-Thomas, St. Bart.'s; Annie L. Jones, Univ. Coll.; H. de B. Kempthorne, Oxford and St. Thomas's; M. Kosloff, Guy's; Janet Y. Laidlaw, Royal Free; N. R. C. Lansdell, King's Coll.; A. M. P. Laurent, Univ. Coll.; A. D. Low and J. M. Low, St. Mary's; J. W. McLaren, St. Thomas's; R. W. McNabb, Guy's; J. G. Madden and G. A. M. Madel, Middlesex; R. L. Mansi, St. Bart.'s; R. M. Marshall, Oxford and St. Bart.'s; S. O. Massey, Middlesex; J. M. Matthew, Cambridge and King's Coll.; Sosa Matthew, M.B. Punjab, Royal Free; C. F. Mayo-Smith, St. George's; T. F. Miles, St. Thomas's; A. Miller and I. Moshinsky, Guy's; D. H. Murphy, Sheffield; R. W. C. Murray, Cambridge and Birmingham; W. H. Mylechreest, Cambridge and St. Thomas's; P. G. A. Nambiar, Royal Free; H. K. G. Nash, Cambridge and Middlesex; L. G. Norman, Univ. Coll.; N. C. O'Bryne, St. Thomas's; M. Oldfield, Leeds; H. J. O'Loughlin, M.B. Manch., Manchester; A. Papert, St. Bart.'s; W. W. Parry, Guy's; G. T. Partridge, Cambridge and St. Bart.'s; G. F. Petty, St. Bart.'s; T. J. Phillips and G. F. Rees-Jones, Univ. Coll.; C. H. Rogerson, Guy's; S. Rosenbloom, Leeds; P. Rosenfeld, St. Bart.'s; C. Rutter, Guy's; R. B. Scott, Oxford and St. Bart.'s; E. Sharp, Guy's; E. W. H. Shaweross, Cambridge and King's Coll.; D. A. Smith, St. Bart.'s; R. B. F. C. Somers, Birmingham; P. Q. M. Spaight, St. Bart.'s; T. C. Stamp and G. W. Thomas, Cambridge and St. Bart.'s; W. P. Thomas, Univ. Coll.; H. S. Tibbits, Cambridge and Birmingham; W. F. Townsend-Coles, London; A. B. Waters, Cambridge and St. Bart.'s; G. Wells,

St., Bart.'s; Shirley E. Whitaker, Univ. Coll.; E. W. M. Williams, Guy's; H. G. Williams, St. Thomas's; L. E. Williams, Univ. Coll.; Mary J. Wilmers, King's Coll.; J. I. Wilson, Univ. Coll.; A. L. Wingfield, St. Thomas's; S. L. Wright, Univ. Coll.; and A. H. Zair, Cambridge and Birmingham.

Royal College of Physicians of London.

On Feb. 5th the College conferred licences to practise physic upon 29 candidates (27 men and 2 women) who have passed the final examination of the Conjoint Board and have compiled with the by-laws of the College. These candidates had not completed their examinations in time for the College meeting on Jan. 29th. The following are the names and medical schools of the successful candidates:—

Khaia Alman-Vtcherachnia, Kiev and Royal Free; W. Aukin, Univ. Coll.; W. S. Baxter, St. Bart.'s; H. W. Benham, Univ. Coll.; A. I. P. Brown, London; A. L. Climer, P. Cohen, M. K. Cusack, D. M. Dean, W. F. George, J. B. Great Rex, and W. H. Hargreaves, St. Bar.t's; R. Herring, St. Mary's; D. T. Ishmael and B. W. Knight, St. Bart.'s; G. A. M. Lintott, Guy's; Muriel H. E. Long, King's Coll.; D. G. Macdonald, Cambridge and London; W. F. McGladdery, St. Bart.'s; G. D. McLean, St. Thomas's; G. W. May, London; D. Nagarajan, L.M.S., Madras Univ.; C. E. S. Oxley, St. Thomas's; H. J. C. Page, St. Mary's; C. F. Price, Univ. Coll.; E. T. Renbom, St. Bart.'s; B. Rubinsky, London; H. Silverberg, Middlesex, and D. O. C. Simpson, London.

Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on Feb. 3rd with Sir Norman Walker, the President, in the chair. Dr. William Archibald Mein (Bournemouth), Dr. Anges Rose Macgregor (Edinburgh) and Dr. James Davidson (Edinburgh) were introduced and took their seats as Fellows. Dr. Ernest Watt (Edinburgh) and Dr. George Matheson Cullen (Edinburgh) were elected to the Fellowship. Dr. H. C. Elder received a certificate of qualification to lecture in Tuberculosis.

University of Durham.

At a meeting in Newcastle of the University of Durham College of Medicine Sir Arthur Sutherland promised £10,000 toward the equipment of a new dental hospital. Sir Arthur's offer will cover the entire cost of the scheme [illegible]

British College of Obstetricians and Gynæcologists.

The quarterly meeting of the Council was held in London on Jan. 24th, with Prof. W. Blair Bell, the President, in the chair. The President handed over, in the name of his wife, the seal of the College, and from himself a set of dies for printing the arms of the College.—The report of the examination committee on a number of applications for membership of the college were adopted, and the recommendations of the Fellowship Committee regarding promotions from membership to the Fellowship were accepted.—Subcommittees were appointed to consider various matters connected with a maternity service for the country, and with the education of medical students in obstetrics and gynæcology.

British Medical Association.

Katherine Bishop Harman Prize, 1932.—The Council of the Association will consider an award of this prize, of the value of £80, in the year 1932. The prize is for the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are liable to arise in pregnancy and child-bearing. Within this sphere competitors are free to select the work they wish to present. All medical practitioners registered in the British Empire are eligible to compete. Should no essay be, in the opinion of the Council, of sufficient merit, no award will be made, but the prize will again be offered in the year following; in this event the money value will be increased. Each essay must be typewritten or printed in English. It must be distinguished by a motto, and accompanied by a sealed envelope marked with the same motto, and enclosing the candidate's name and address. Essays must reach the medical secretary (to whom inquiries may be addressed), British Medical Association House, Tavistock-square, W.C.1, not later tha Dec. 31st, 1931.

Middlemore Prize, 1932.—This prize, a cheque for £50 and a certificate, is awarded for the best essay or work on any subject which the Council of the Association may from time to time select in any department of ophthalmic medicine or surgery. The award in 1932 will be for the best essay on Sympathetic Ophthalmia before and after 1914. Essays submitted in competition must reach the medical secretary not later than Dec. 31st, 1931. The precautions for preserving anonymity are the same as those enjoined for the Katherine Bishop Harman Prize. In the event of no essay being of sufficient merit, the prize will not be awarded in 1932.

Chadwick Public Lectures.

Sir William Collins will take the chair at a meeting at 90, Buckingham Palace-road, London, S.W., on Tuesday, Feb. 24th, at 8 P.M., when Mr. E. A. Elsby will speak on Silicosis Prevention Methods. Mr. Elsby has been studying this subject as Chadwick travelling scholar for 1929–30. Among lectures in the spring programme is one by Prof. Major Greenwood, F.R.S., on Nerves and the Public Health. The offices of the Chadwick Trust are at 204, Abbey House, Westminster, S.W.

Fellowship of Medicine and Post-graduate Medical Association.

Arrangements for the coming week will be found in our Medical Diary. A special all-day course in diseases of children will be given at the Queen's Hospital for Children, Bethnal Green, from Feb. 16th to 28th. Courses will be given in March at the West End Hospital for Nervous Diseases, at St. John's Hospital (dermatology), at Bethlem Royal Hospital, at the Royal Waterloo Hospital (medicine, surgery, and gynæcology), and at the Royal National Orthopædic Hospital. Syllabuses are now being prepared, and copies will be sent on application to the Fellowship at 1, Wimpole-street, London, W. 1. Courses in venereal disease are available at the Royal Free Hospital for women graduates only.

King Edward VII. Hospital, Windsor.

Sir Joseph Skevington, the senior surgeon, and his brother Major Skevington, have equipped a new operating theatre in memory of their sister, who for many years took a keen interest in this hospital. Four new wards and a nurses hostel have been opened, the total cost, with the operating theatre being about £55,000, of which all but £6000 has been raised. The hospital now has three operating theatres.

Hospital Costs.

The average cost of each in-patient (4606) of Halifax Royal Infirmary last year was £5 14*s.* 3*d.*, as against £6 5*s.* 11*d.* in 1929. The average cost per occupied bed per annum was £124 11*s.* 1*d.*, as against £130 1*s.* 2*d.* in 1929. —The average stay last year of the 214 in-patients at Okehampton Cottage Hospital was 19·36 days, and their average cost 12*s.* per day.

Private Wards at Harrow Hospital.

Harrow Hospital is providing private wards for subscribers whose incomes do not exceed £750 a year. A single person will pay 1 guinea a year; a married couple with children will pay 2 guineas. The free treatment will include hospital charges and doctors' fees, but not consultants' fees, operations, or special nurses.

Northamptonshire Hospitals.

The 187th annual report of Northampton General Hospital, which covers the year ending August 31st, 1930, shows that there were 4147 in-patients, of whom 247 were private patients, whose average stay was 19 days. They cost £8 1*s.* 7*d.* each, an increase on the preceding year of 7*s.* 2*d.*; the average cost per bed per day was 9*s.* 1*d.* The out-patients numbered 18,122, an increase of nearly 1250; they cost 7*s.* 1*d.* each. The income of £42,884 included £7750 from the Northamptonshire Hospital Week Committee, and a similar sum from the Northampton and County Hospital and Convalescent Fund, an aggregate increase of £4250.—The Northamptonshire public assistance committee has recommended that the county council should subscribe to various hospitals in respect of the hospital treatment of persons in receipt of poor relief, the amounts of the subscriptions to equal the actual cost of treatment, plus an addition of 20 per cent. as remuneration of the honorary medical staff in respect of their attendance on the cases. Payments are also to be made to various voluntary organisations.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

A Bill to Regulate Osteopathy.

ON Feb. 11th, at the instance of an organisation called The Osteopathic Defence League, Mr. W. M. Adamson, the Labour Member for Cannock, is to ask leave to introduce a Bill entitled the Registration and Regulation of Osteopathy Bill. The aim of this Bill, as described by its sponsors, is "to place the osteopathic practitioner who has the necessary educational attainments and practical competence upon an equality with members of the orthodox medical profession." It is claimed that the Bill is supported by a petition signed by nearly 15,000 people.

HOUSE OF LORDS.

TUESDAY, FEB. 10TH.

PURE MILK.

Viscount ASTOR called attention to the needs of the dairy industry and to the necessity for developing the demand for the supply of British milk. He said that milk was not merely important to the farming industry but was a most valuable food for children. There was tremendous under-consumption of milk in this country. To increase demand there must be publicity and propaganda, the cost of milk must be reduced, and its hygienic quality and cleanliness improved. At present only £16,000 was spent annually in advertising fresh milk, while £250,000 was spent on advertising patent foods. The Government should do something to stimulate the giving of milk to children in the elementary schools. That would help the dairy industry and improve the health of the children. The Government should also assist the publicity movement as a whole. The price of milk to the consumer could be reduced if farmers would adopt more business-like methods. If the nation was urged to drink more milk there must be a guarantee that the milk which was offered to the public was reasonably safe and clean. It was relatively easy to produce cleanly, with clean methods of milking and handling, and it would not cost much. By simplifying the classification of milk the public would be given greater confidence, and the consumption of milk would be stimulated.

Lord MOYNIHAN supported Lord Astor's plea for a larger supply of milk, but, he said, he did so with certain qualifications. Milk was rarely pure and was often contaminated, with the inevitable result that it caused a number of diseases. The supply of milk, therefore, was not the only problem. It was only when there was an acute outbreak of disease that the mind of the people was stimulated. Every year 50,000 people died from cancer; 100 people died every day from tuberculosis; and £250,000 was spent every day in this country alone on the treatment of tuberculosis, a large proportion of which was preventable. The milk problem was not only an agricultural problem, but a human problem. Of the 3,250,000 cows in this country giving milk, over 1,000,000 were suffering from tuberculosis. It was also, in large measure, a financial problem. What was to be done? A milk supply was very necessary. Were they to slaughter all the cows affected by tuberculosis? If that were done it would be ineffective, except in so far as the immediate present was concerned. To immunise the animals would be a matter of great difficulty and uncertainty. The problem to be considered was whether the present conditions of our milk supply could be improved. One of the first methods was by boiling, which would destroy all organisms. That method was easily available, and cost virtually nothing. Every drop of milk that was taken into his house was boiled. It was true that there were certain disadvantages in boiling, but the nutritive value of milk, contrary to the general opinion, was not diminished by boiling. The vitamins were destroyed, however, and from the point of view of general consumption there was no doubt that the boiling of milk reduced its value. The second method that could be adopted to make ordinary milk fit for human consumption was pasteurisation. Ninety per cent. of the milk in London and Manchester was pasteurised. A great deal depended on the human material used in the process of pasteurisation. About a year ago an article appeared in *The Times* asserting, on very competent authority, that pasteurisation had failed, in the opinion of the medical men in London. But pasteurisation was perfectly satisfactory; it destroyed bacilli. It was essential that the machinery of pasteurisation should be constantly supervised, and that the greatest possible bacteriological control should be exercised at every stage. It was most desirable that the milk provided for pasteurisation should be as pure as possible. There was no doubt that an increased supply of milk was necessary and that tainted milk could be made fit for human consumption in a variety of ways. Some further inquiry than any that had yet been made into the question of the milk supply was necessary, and it might be well if the Government would set up a Royal Commission to reconstruct all the knowledge which had so far been obtained about the problem. The great ideal was that they should have a milk supply for the people of this country which it was possible for them to drink without those grave risks to health which had been so profitable to members of his own profession.

The Earl of RADNOR said that there were no figures to show the amount of disease prevented by the consumption of milk. Milk was a very necessary part of the child's diet, and if it were withdrawn it was probable that the resultant diseases would be far worse than any diseases actually traceable to the consumption of tainted milk.

The Earl of IVEAGH suggested that the Government should set up a committee of inquiry to bring up to date all the information available about milk. If they believed all that Lord Moynihan said, then they would never drink a drop of milk again, at least unless it was boiled. At this moment scientific opinion on milk was extremely divided. Such an inquiry should consider whether the evidence was for or against pasteurisation of milk.

The Earl of ONSLOW said that the first thing to be done to increase the consumption of milk was to reduce the costs of production. If anything could be done to simplify the grading of milk it would be a great advantage.

Earl DE LA WARR (Parliamentary Secretary to the Ministry of Agriculture) said he could not feel that the medical profession were entirely free from blame in this matter. One of the reasons why more clean milk was not produced in this country was the lack of demand. A great deal of Grade A milk to-day was sold as ordinary milk at ordinary prices. If the medical profession would talk a little less about dirty milk, and do a little more to encourage the buying of clean milk which was already in the market, they would be of more use to the nation as a whole and to the agricultural industry. They would also help the Government if they would make up their minds as to what they really felt about milk. Before the medical profession came down on the farming industry for not taking certain steps about milk, they should really make up their minds what they wanted the farmers to do.

Lord MOYNIHAN: We want you to produce pure milk. Until that is done we suggest that all milk should be pasteurised.

Earl DE LA WARR, continuing, said that he agreed that grade designations of milk were in an unsatisfactory state, but it was a very difficult problem to solve while there was so much disagreement in the industry. If the Minister of Agriculture could have

some assurance of general support for a revision of these designations, he would be only too glad to discuss the matter with the producers.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 4TH.

Eye strain among Civil Service Clerks.

Mr. WILLIAM BROWN asked the Postmaster-General whether, in view of the extraordinary amount of sick leave for eyestrain granted to clerical officers in the ledger sections of the Savings Bank Department during 1929 and 1930, he intended to instal individual lighting in addition to flood lighting in the above sections.—Mr. H. B. LEES-SMITH replied: No, Sir. The improvements in the lighting at the Savings Bank Department, to which I referred in my reply on Dec. 15th, have now been completed. The introduction of individual lighting would result in conditions more conducive to eyestrain than the present system of general lighting, and would be a retrograde step.

Health of the Navy.

Mr. HORE-BELISHA asked the First Lord of the Admiralty if he could give any reasons for the increase in the incidence of disease in the Royal Navy, as revealed in reports on the health of the Navy for 1929.—Mr. G. H. HALL replied: The increases in the incidence of disease in the Royal Navy during 1929 were due principally to augmented figures for influenza and diseases of the respiratory system. The vast majority of these cases were of a mild nature. The slight increases shown in 1929 afforded no grounds for anxiety as to the state of health existing in His Majesty's Navy.

THURSDAY, FEB. 5TH.

Pensioners and Seven Years' Limit.

Mr. D. G. SOMERVILLE asked the Minister of Pensions the number of applications in respect of cases outside the seven years' limit which had been investigated by his Department in each of the last three years; the number of such cases in which favourable awards had been made; and the aggregate annual payment which these awards entailed.—Mr. ROBERTS replied: I have no record of the aggregate number of the applications of this nature which were dealt with by the Ministry during the years in question, but the number of cases in which the application was recognised by the Ministry either by way of treatment or pecuniary compensation was in 1928, 318; in 1929, 497; and in 1930, 991. The present annual cost of the awards made is estimated at approximately £70,000. No record is available of the cost of treatment and treatment allowances in the cases in which treatment has been provided.

Poor-law Children's Homes.

Mr. LOVAT-FRASER asked the Minister of Health if he was aware that children over 3 years of age were living in the Lancaster Institution and the Hornby Institution, under the control of the Lancaster Public Assistance Committee, contrary to the regulations of the Ministry; and if he would have them removed.—Miss SUSAN LAWRENCE replied: My right hon. friend understands that there are no children over 3 years of age living in the ordinary wards of the institution at Lancaster. There are 54 children in the Park Side Children's Home which is adjacent to, but distinct from, the institution, with a separate entrance. The Hornby Institution has, for some time, with my right hon. friend's concurrence, been mainly used to accommodate mentally defective and backward children. The use of this institution will no doubt be further considered as part of the general problem of classification in the county.

Mr. LOVAT-FRASER asked the Minister of Health if he was aware that the children's home at Rochford, under the Southend Public Assistance Committee, was overcrowded; and if he would secure improvement in this respect.—Miss SUSAN LAWRENCE replied: Yes, Sir. My right hon. friend brought this matter to the notice of the Council in June last, and understands that they are considering the provision of increased accommodation. My right hon. friend is keeping in touch with the Council on the matter.

Ophthalmic Benefit.

Mr. WOMERSLEY asked the Minister of Health if he was aware that, as a result of the operation of Section 25, Paragraph (5) (*b*), of the National Health Insurance (Additional Benefits) Regulations, 1930 (Provisional Regulations, dated June 18th, 1930), a large number of unqualified suppliers of optical glasses were now giving ophthalmic treatment and supplying glasses; and what action he proposed to take.—Miss SUSAN LAWRENCE replied: The provision of the Regulations to which the hon. Member refers is designed to conform to the principle of free choice of practitioner which was laid down by the National Health Insurance Act, 1928. My right hon. friend has no evidence that it has resulted in unsuitable treatment or appliances being provided to insured persons; and in his view a sufficient safeguard is furnished by the authority given to a society, if it has good reason for doing so in a particular case, to withhold consent to a member obtaining glasses from an optician who is not a member of an organisation recognised by the society.

Hospitals and Supply of Drugs to Panel Patients.

Mr. FREEMAN asked the Minister of Health how many, if any, hospitals had been registered under the National Health Insurance Act for the supply of medicine, drugs, and appliances to panel patients; and whether he proposed to take any action in this matter.—Miss SUSAN LAWRENCE replied: So far as my right hon. friend is aware, no hospital is included in any list of persons supplying drugs, medicines, and appliances under the National Health Insurance Acts. The second part of the question does not, therefore, arise.

Co-operative Benefits on Insurance Prescriptions.

Sir KINGSLEY WOOD asked the Minister of Health whether he had taken any action with reference to the representations of the Co-operative Congress and other co-operative societies and bodies against the regulations which prohibited the payment of co-operative dividends on national health insurance prescriptions.—Miss SUSAN LAWRENCE replied: My right hon. friend has decided to revoke Clause 4 (4) of the terms of service of insurance chemists, which covers this matter, and has informed the representative bodies concerned accordingly.

Sir KINGSLEY WOOD asked when this change would be made.

Miss LAWRENCE: Very shortly.

Sewage Water in Kensington.

Mr. WEST asked the Minister of Health whether steps were being taken to prevent the flooding of houses with sewage water in Kensington.—Miss SUSAN LAWRENCE replied: My right hon. friend understands that the London County Council have taken and are taking extensive measures to improve their storm relief sewerage system so as to prevent as far as practicable the flooding of premises in Kensington.

Surveys of Local Health Services.

Lieut.-Colonel FREMANTLE asked the Minister of Health when the surveys of the health services of local authorities by the officers of his department would be sufficiently advanced for him to say in how many areas no propaganda on venereal disease was being undertaken.—Miss SUSAN LAWRENCE replied: It is anticipated that the initial surveys of the health services of the county and county borough councils will be completed in about two years' time.

Lieut.-Colonel FREMANTLE: Does that mean that no action can possibly be taken until two years' time?

Miss LAWRENCE: I would not go so far as that.

London Cleansing.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he had received the report of the Metropolitan Boroughs' Standing Joint Committee on the recommendations of the departmental committee on London cleansing; and what action he proposed to take with a view to centralisation of the disposal of house, trade, and street refuse in London.—Miss SUSAN LAWRENCE replied: My right hon. friend has now received a report from the Standing Joint Committee which indicates than 11 metropolitan sanitary authorities were in favour of centralisation and 18 against it. The question is receiving my right hon. friend's further consideration, but it is not practicable to contemplate introducing legislation this session.

Amendment of the Children's Act, 1908.

Viscountess ASTOR asked the Home Secretary whether he could give any indication when the Bill amending the Children's Act, 1908, would be introduced.—Mr. CLYNES replied: I should be glad if I could find it possible later in the session to introduce this Bill, but at present I am afraid I cannot make any more definite statement.

FRIDAY, FEB. 6TH.

Invaliding from the Navy.

Mr. HORE-BELISHA asked the First Lord of the Admiralty the number of ratings invalided from the Royal Navy during the year 1930; the number whose invaliding dis-

ability was considered to be attributable to the Service; the number of ratings invalided during the same period suffering from consumption; the number of cases accepted as being attributable to the Service; and the number to whom disability pensions were granted.—Mr. AMMON (Parliamentary Secretary to the Admiralty) replied: The particulars are as follows: Ratings invalided during 1930, 1100; disability accepted as attributable to the Service, 223; ratings invalided during 1930 for consumption (pulmonary tuberculosis), 196; number (included in the above figure of 196) whose disability was accepted as attributable to the Service, 143; invalided for pulmonary tuberculosis and granted disability pensions, 143.

MONDAY, FEB. 9TH.

Telephone Concessions to Doctors.

Sir WILLIAM BRASS asked the Postmaster-General whether in order to popularise the telephone service in rural areas he would consider reducing the business rate paid by farmers, doctors, and nurses to that of the residential rate; and what the cost of this concession would be.—Mr. LEES-SMITH replied: I regret that in the application of telephone rates I cannot discriminate between farmers, doctors, nurses, and subscribers engaged in other businesses or professions. In the absence of detailed information as to the number of subscribers in the classes mentioned, I cannot state what would be the cost of such a concession; but it would be large and increasing.

Children in Droitwich Institution.

Mr. LOVAT-FRASER asked the Minister of Health how many children over the age of three were living in the institution at Droitwich.—Miss SUSAN LAWRENCE replied: There are no healthy children over three in the Droitwich Institution. My right hon. friend is informed that there are two in the sick wards who are there for medical reasons.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Feb. 17th.—5.30 P.M., GENERAL MEETING OF FELLOWS. 8 for 8.30 P.M., PATHOLOGY.
WEDNESDAY.—8.30 P.M., RECEPTION. Fellows and their Friends will be received in the Library by the President and Mrs. Watts Eden. At 9.15 P.M., Dr. H. Letheby Tidy will give an address entitled Poisoners of Ancient Times.
THURSDAY.—5 P.M., DERMATOLOGY AND COMPARATIVE MEDICINE. (Cases at 4 P.M.) Special discussion on Scabies and Ringworm as Transmissible Between Animals and Man. Openers: Dr. Arthur Whitfield and Dr. W. J. O'Donovan (Dermatology). Mr. J. W. H. Holmes, Mr. G. H. Livesey, and Mr. A. W. Noel Pilliers (Comparative Medicine). Other speakers will take part. Cases will not be discussed.
FRIDAY.—5 P.M., BALNEOLOGY AND CLIMATOLOGY. Discussion on Research on Physiological Effects of Baths. 8 P.M., OBSTETRICS AND GYNÆCOLOGY. Specimen: Sir Ewen Maclean: Very Large Vesical Calculus. Cases: Lady Barrett: 1. Chorion Epithelioma. 2. Carcinoma of the Fallopian Tube. Paper: Dr. A. A. Osman and Dr. Harold G. Close: Observations on the Plasma Bicarbonate, and the Value of Alkalis in the Treatment of Some of the Renal Complications of Pregnancy. 8.30 P.M., ELECTRO-THERAPEUTICS. Discussion on the future policy of the Section, with a view to making such recommendations as may be considered necessary by the Members present.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 16th.—9 P.M., Dr. J. W. McNee: The Spleen: Its Structure, Functions, and Diseases. (First Lettsomian Lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, Feb. 19th.—7.45 P.M., Demonstration. 8.15 P.M., Dr. H. C. de Souza-Araujo, of the Instituto Oswaldo Cruz, Rio de Janeiro, Brazil: Experimental Leprosy and the Treatment of Leprosy.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.
FRIDAY, Feb. 20th.—5 P.M., Dr. J. A. Charles and Dr. S. H. Warren: Bacillus Dysentery in Great Britain.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck street, W.
THURSDAY, Feb. 19th.—8.30 P.M., Mr. C. E. S. Phillips: Preparation of Radium Salts for Therapeutic Use. Prof. E. N. da C. Andrade: Model to Illustrate Passage of an Alpha Particle in the Neighbourhood of an Atomic Nucleus. Dr. W. Roy Ward: Some Aspects of Radium Therapy. Dr. Arthur Burrows: Organisation of the Radium and X Ray Cancer Service in Australia.
FRIDAY.—11 A.M., Visit to Radiological Dept. of King's College Hospital. 5 P.M., Dr. H. Cohen and Dr. P. H. Whitaker: Cinematograph of Ventriculography. Dr. R. E. Roberts: Lymphosarcoma involving the Stomach. Carcinoma of Lung. Dr. J. H. Mather: Idiopathic Myositis Ossificans. Dr. Graham Hodgson: Sinus Investigation. Dr. Thurstan Holland: Radiograms.

ROYAL INSTITUTION, 21, Albemarle-street, W.
THURSDAY, Feb. 19th.—5.15 P.M., Prof. J. B. S. Haldane: Respiration.
FRIDAY.—9 P.M., Prof. J. B. S. Haldane: Prehistory and Genetics.

CHELSEA CLINICAL SOCIETY.
TUESDAY, Feb. 17th.—8.30 P.M. (at Hotel Rembrandt, Thurlow-place, S.W.). Discussion on the Treatment of Glandular Deficiencies. Opener: Dr. W. Langdon Brown. (Preceded by Dinner at 7.30 P.M.)

ROYAL MICROSCOPICAL SOCIETY.
WEDNESDAY, Feb. 18th.—5 to 5.30 P.M. (at Hastings Hall, B.M.A. House, Tavistock-square, W.C.). Prof. Robert Chambers (New York): The Nature of the Living Cell (with Demonstration).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 16th, to SATURDAY, Feb. 21st.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Mon., 4 P.M., free lecture by Dame Louise McIlroy on Early Diagnosis of Uterine Cancer with Lantern Demonstration.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Free demonstration of Gynæcological Operations by Mr. F. Cook on Mon., 2 P.M.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Free dermatological demonstration by Dr. A. C. Roxburgh on Fri., 2 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Fri., 4.30 P.M., Special lecture on Routine Measures after Abdominal Operations. By Mr. Rodney Maingot.—QUEEN'S HOSPITAL FOR CHILDREN, Bethnal-green, E. Special Course in Diseases of Children. All day.—HOSPITAL FOR TROPICAL DISEASES, 25, Gordon-street, W.C. Special post-graduate course in Tropical Medicine. All day.—Further particulars from the Fellowship of Medicine.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-Road, W.C.
FRIDAY, Feb. 20th.—4 P.M., Mr. Lowndes Yates: Curable and Incurable Deafness.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Feb. 17th.—3.15 P.M., Dr. E. G. B. Calvert: Arthritis (with cases).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Feb. 18th.—4 P.M. (at the Battersea Mortuary). Dr. R. M. Bronte: The Making of a Post-mortem Examination.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
THURSDAY, Feb. 19th.—5 P.M., Dr. H. C. Lucey: Clinical Pathology of Pregnancy.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.
FRIDAY, Feb. 20th.—5 P.M. (at 11, Chandos-street, Cavendish-square, W.). Dr. W. J. O'Donovan: Impetigo in Day and Public Schools.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Feb. 19th.—9 P.M., Mr. J. B. Hunter: Surgery of the Lung.

UNIVERSITY COLLEGE MEDICAL SCHOOL, University-street, W.C.
TUESDAY, Feb. 17th.—5.15 P.M., Dr. Janet Vaughan: Pathology and Treatment of Pernicious Anæmia.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Agar-street, W.C.
SUNDAY, Feb. 15th.—10.30 A.M., Mr. W. H. Mullen: Causes of Failing Sight in Old Age. 11.45 A.M., Mr. L. G. Brown: Questions and Answers in Relation to Diseases of the Ear.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 18th.—4 P.M., Dr. Thomas Marlin: Bone Setting.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (Public Health Division), Keppel-street, Gower-street, W.C.
MONDAY, Feb. 16th.—5 P.M., Col. L. W. Harrison: Venereal Disease Schemes.
WEDNESDAY.—5 P.M., Col. Harrison: Treatment Centres.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Feb. 16th.—2.30 to 5 P.M.: Medical Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 17th.—5 P.M., Dr. J. E. M. Wigley: Lupus Erythematosus.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 16th.—12 noon, Dr. Greenfield: Pathology of Demyelinating Diseases. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Cerebral Anæmia and Hyperæmia.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Meningeal Hæmorrhage.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Demonstration of Methods of Testing the Eighth Nerve.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M. Dr. Collier: Neurosyphilis.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 20th.—4.15 P.M. (at the Whitworth-street West Branch), Dr. Lapage: Bronchitis, Pneumonia, and Asthma in Infancy and Childhood.

Appointments

GERRARD, E. A., M.B. Manch., M.R.C.S., has been appointed Assistant Surgical Officer to Gynæcological Dept., Manchester Royal Infirmary.

STRANGE, E. H., Certifying Surgeon under the Factory and Workshop Acts for Hackney.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Hon. Asst. Medical Electrician and Radiologist.
Barry, U.D.C. Surgical Hospital.—H.S. £200.
Bedford County Hospital.—Asst. H.S. At rate of £130.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. Surg.
Birmingham General Hospital.—H.P. £70.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £110.
Bradford, Municipal General Hospital, St. Lukes.—H.P.'s and H.S.'s. Each at rate of £200.
Bristol Royal Infirmary.—Radium Officer. £600.
Cardiff Royal Infirmary.—Ophth. H.S. Also Surg. H.S. At rate of £75 and £50 respectively.
Carlisle, Cumberland Infirmary.—Second H.S. Also H.S. to Spec. Depts. Each at rate of £155.
Carlisle, Cumberland and Westmorland Mental Hospital, Garlands.—Jun. Asst. M.O. £350.
Chester Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept. £150.
Chester, Wrenbury Hall Tuberculosis Training Colony.—Res. H.P. £250.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Coventry and Warwickshire Hospital.—Res. H.P. £160.
Derby County.—Deputy County M.O.H. £840.
Dundee, City of.—Asst. M.O.H. £600.
Durham County Council.—Asst. School M.O. £500.
Edinburgh Mental Health Services.—M.O. £1000–£1250.
Evelina Hospital for Children, Southwark, S.E.—Hon. Dental Surgeon.
Exeter, Princess Elizabeth Orthopædic Hospital.—Orthopædic Surgeon. £600.
Glasgow Eye Infirmary.—Res. Asst. H.S. £150.
Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £120.
Golden-square, Throat, Nose, and Ear Hospital, W.—Hon. Asst. Surg.
Gravesend and North Kent Hospital.—Jun. H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. £140.
Hertford, Borough of.—M.O.H. £800.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300.
Hull Royal Infirmary.—H.P. for Sutton Branch. At rate of £160.
Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.
Lambeth Metropolitan Borough.—Two Con. Obstetricians. 4 gns. a case.
Leeds University, Department of Pathology and Research.—Lecturer in Pathology. £500.
Leicester, City Mental Hospital, Humberstone.—Second Asst. Res. M.O. £450.
Liverpool, David Lewis Northern Hospital.—H.S. two H.P.'s. Each at rate of £100.
Liverpool Eye and Ear Infirmary, Myrtle-street.—Ophth. H.S. £100.
London Homœopathic Hospital, Great Ormond-street and Queen-square, Bloomsbury, W.C.—Asst. Phys. for Diseases of Children.
Maidstone, Kent County Hospital.—Asst. M.O. £509.
Manchester, Ancoats Hospital.—Res. M.O. At rate of £150.
Margate and District General Hospital.—Res. M.O. £125.
Metropolitan Hospital, Kingsland-road, E.—Physician.
Miller General Hospital, Greenwich-road, S.E.—Res. Surg. O. and Reg. £250.
Newark General Hospital.—Res. H.S. £175.
Newcastle General Hospital, Newcastle-upon-Tyne.—H.P. At rate of £100.
Newcastle-on-Tyne, Royal Victoria Infirmary.—Sen. M.O. and Two Jun. M.O.'s. At rate of £200 and £100 respectively.
North Kensington Women's Welfare Centre, Telford-road, W.—M.O. 1½ gns.
Nottingham Hospital for Women.—H.S. At rate of £150.
Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. At rate of £200.
Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.
Plymouth, South Devon and East Cornwall Hospital.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £100.
Poplar Metropolitan Borough of.—Asst. M.O.H., Tuberculosis Section. £600.
Portsmouth, Royal Hospital.—Third H.S. At rate of £130.
Prince of Wales's General Hospital, N.—Hon. Surg. Reg. £100.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Dist. Res. M.O. and Asst. Res. M.O. Each at rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100. Second Surg. to Ear, Nose, and Throat Dept. Also Clin. Asst. 5s. per attendance.
Royal College of Surgeons of England.—Examiner.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Asst. Dental Surgeon. 25 gns.
St. Bartholomew's Hospital, E.C.—Dental H.S. £80.
St. Thomas's Hospital.—Res. Asst. Phy. and Res. Asst. Surg. Also Chief Asst. to Throat Dept.
Salisbury, General Infirmary.—Two H.S.'s and H.P. Each £150
Sheffield, Royal Hospital.—Ophth. H.S. £120. Also Res. Anæsthetist. £80–£100.
Shoreditch Metropolitan Borough, E.C.—Public Vaccinator.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.
South Shields, Ingham Infirmary.—H.S. £150.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £180.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.
Sutton, Surrey, Sutton and Cheam Hospital.—Hon. Radiologist.
Swanley, Kent, Hospital Convalescent Home.—Res. M.O. At rate of £200.
Swansea General and Eye Hospital.—Cas. O. £200.
Tilbury Hospital, Essex.—H.S. At rate of £150.
University College Hospital, W.C.—Hon. Surgeon. Ear, Nose, and Throat Department.
Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.
Weston-Super-Mare General Hospital.—Res. H.S. At rate of £150.
Weymouth and District Hospital.—H.S. £180.
Wolverhampton, Royal Hospital.—H.S. for Ear, Throat and Nose Dept. At rate of £100.
Wrexham and East Denbighshire War Memorial Hospital.—Hon. Asst. Phys. and Surg.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Northleach (Glos.).

Births, Marriages, and Deaths

BIRTHS.

BROOKE.—On Feb. 2nd, the wife of Ralph Brooke, M.S. F.R.C.S., of Warren Lodge, Western-place, Worthing, of a son.

HARRIS.—On Feb. 5th, at Springfield Hospital, Wandsworth Common, the wife of Noel G. Harris, M.B., B.S., of a daughter.

PORTER.—On Feb. 3rd, at Kidderminster, the wife of Dr. C. Petvin Porter, of a son.

SLOANE.—On Feb. 4th, at Southsea, the wife of Surgeon Lieut. J. M. Sloane, R.N., of a daughter.

MARRIAGES.

HAINES—MACPHAIL.—On Feb. 5th, at All Saints' Parish Church, West Bromwich, Major George H. Haines, M.C., R.A.M.C., to Laura Ailsa, daughter of the late Dugald MacPhail and Mrs. Laura MacPhail, Dagger-lane, West Bromwich.

MACKENZIE—AINSWORTH.—On Jan. 26th at the Chapel of the Savoy, Major E. F. W. Mackenzie, O.B.E., M.C., R.A.M.C., to Violet May, elder daughter of Colonel and Mrs. R. B. Ainsworth, of Monteagle House, Twickenham Park, Middlesex.

DEATHS.

BERRILL.—On Feb. 2nd, at Park Hall, Great Bardfield, Braintree, Essex, suddenly, Alfred Berrill, M.R.C.S., L.C.R.P. Lond., late of Woodford, in his 67th year.

BIRKETT.—On Feb. 5th, George Edmondson Birkett, M.C., B.A. Camb., M.R.C.S., Honorary Radiologist, Manchester and District Radium Institute, aged 37.

FOULERTON.—On Feb. 2nd, at his residence, Morpeth-terrace, S.W.1, Alexander Grant Russell Foulerton, O.B.E., F.R.C.S., L.R.C.P., D.P.H., aged 67 years.

RIDPATH.—On Feb. 8th, at Thornhill-crescent, Sunderland, David Ridpath, M.D., in his 87th year.

ROBERTSON.—On Jan. 31st, at Chester-crescent, Lee-on-Solent, Hampshire, James Sprent Robertson, M.D., aged 74.

THOMAS.—On Jan. 30th, at his residence, Bron-y-Gaer, Newport, Mon., Sir (Abraham) Garrod Thomas, M.D., D.L., LL.D. aged 77.

VERNON.—On Feb. 1st, at "Drayton," Queen's Park-gardens, Bournemouth, Lieut-Colonel Arthur Heygate Vernon, T.D., J.P., F.R.C.S. late R.A.M.C. (T.), aged 66.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

FEMININE PSYCHOLOGY.

AN attempt has been made by certain American women doctors, teachers, and social workers to shed light on the dark places of the psychology of their own sex by means of an exhaustive inquiry.[1] A questionaire was issued to 10,000 married women selected at random from the membership lists of women's clubs and kindred organisations, and to 10,000 college graduates of more than five years' standing. Some 1000 married women and 1200 of the unmarried replied. In view of possible criticism it is only fair to state that Dr. Davis, who conducted the inquiry, took elaborate precautions to ensure that her informants were a fair sample of educated womanhood, but there was possibly a preponderance of those who had lived in communities of their own sex, and this may have had some effect on the replies. How far complete objective reliability of statement on sex matters can ever be obtained, even in an anonymous questionaire, is another matter.

The subjects investigated included the use of contraceptives, the practice of abortion, factors determining the happiness of married life, auto-erotic and homosexual tendencies, the periodicity of sex desire in the married and unmarried, and the value of sex education. The analysis is handled with great statistical skill, but is over elaborated; a simpler presentation of the conclusions would have been welcome. A few of the inquiries led to results that may have been unexpected. For example, of 1000 married women, 730 stated that they had used contraceptives; the average number of children among those 730 appears to have been greater than the average among 270 who did not use contraceptives. The effects of birth control on health, fertility, and marital happiness would be very difficult to elucidate from these figures, and indeed they indicate how complex are the factors which must be taken into account when conclusions are drawn on the effect of contraceptives in any community. Of the 1000 women, 93 had had artificial abortion performed (some many times), and in all but a few for reasons other than health; in the larger proportion of these cases contraceptives had been tried and failed. Among the unmarried women no less than 64·8 per cent. admitted to masturbation at some time or other of their lives. It is surprising to learn that although about 60 per cent. of women who masturbate start the practice before 16, only 14 per cent. contract the habit in college, as compared with over 20 per cent. who deliberately begin between the ages of 22 and 40, usually as a relief for sex feeling if marriage did not take place. The statements of the women show that while the evils of the practice have been greatly exaggerated, about half of those admitting to the practice had already dropped it. The section on homosexual practices will be challenged in many quarters. Dr. Davis had already been led by her experiences among both normal and delinquent women in communities to expect a high percentage, and she finds that 50·4 of her informants admit to "intense emotional relations" with other women. In 293 out of 1200 replies the writers deny that they were conscious at the time that the emotion was sexual in character, but 78 recognised it as such later, and in another 234 it was accompanied by overt acts of an unmistakable significance. It is this latter group which will appear so unexpectedly large, even to the psychiatrist disillusioned by the study of the abnormal. The author hints that the replies show that certain kinds of college life tend to fix the vague and fleeting homosexual impulses so common in childhood and adolescence, and her figures are unduly weighted by the fact that her information was drawn from graduates. Both extra-marital relations with men and masturbation are more common among the homosexuals; the true fixed invert is rare. The whole trend of this evidence goes to support the Freudian theory of homosexuality as the persistence of a phase of infantile sexuality. It is again contrary to the usual experience to find 570 out of 808 unmarried women claiming to recognise some periodicity of sex desire; 272 experienced a regular periodicity, and in 110 out of the 808 it has been possible to chart the actual day with reference to the menstrual period. The most frequent point in the cycle for desire to be noted is the week preceding menstruation, but a considerable number place it a few days after. In a group of 200 women, married and unmarried, "the time of highest frequency of desire coincides with the least likelihood of conception," p. 229. The physiological basis for such a curious phenomenon is important to determine, but the whole study obviously needs confirmation.

Dr. Davis is to be congratulated on a gallant effort to obtain facts essential for the proper understanding of the mind in health or disease, but extraordinarily hard to collect. She has made a real contribution in an important field.

[1] Factors in the Sex Life of Twenty-two Hundred Women. By Katherine Bement Davis, Ph.D. Publication of the Bureau of Social Hygiene. London and New York: Harper and Brothers, Ltd. 1930. Pp. 430. 12*s.* 6*d.*

TULARÆMIA IN NORWAY.

TWO papers in *Norsk Magazin for Laegevidenskaben* for January illustrate the old experience that as soon as a hitherto unknown disease is accurately described and defined, many cases of it are promptly diagnosed. Tularæmia is a case in point. It was only last year that Dr. T. Thjötta first reported three cases in Norway. A little later in the same year this number had risen to 11. In the paper he has now published he says that about 50 cases have been described and the figure is increasing steadily. The disease is, indeed, already familiar to so many doctors in Norway that they recognise it easily from the clinical picture, provided the patient gives a history of having handled a hare. Some 25 human cases of the ulcero-glandular type of tularæmia have been observed on fox-farms where the foxes had been fed on hares. One of the most interesting cases reported was that of a man who found a dead hare on the ground, handled it, and then threw it away. This brief contact was sufficient to give him the disease. Another man contracted it the day after he had carried a skinned hare, packed in thin paper, for only about 200 metres. The first case suggests that infected insects from the dead animal had conveyed the disease to the man in question, and it would seem that the second patient was infected through the unbroken skin by blood-stained fluid which had soaked through the paper wrapper. Dr. Thjötta does not incriminate hares only, and he records cases in which infection through hares could be eliminated, and lemmings or field mice were definitely suspect. One patient was infected by the bite of a cat in a district where dead field mice were numerous, and Dr. Thjötta suggests that the cat was merely a link between an infected field mouse and the patient. He attaches special importance to the periodic migrations of lemmings from their mountain fastnesses down to the valleys and fjords, and he refers to the old observation that such lemming years are followed by years of a high mortality-rate among hares. In the other paper in the same number of *Norsk Magazin*, Dr. H. A. Salvesen, after recording four cases, concludes that shooting hares in Norway is a dangerous sport. Not only "the man who shoots the hares," but all who have to handle it, from the game-dealer to the cook, are liable to contract a disease which, even though it is not likely to prove fatal, is serious enough on account of the many weeks of invalidism it inflicts. The relation of tularæmia to hares is already known to many outside the medical profession in Norway, and rubber gloves are being used in the handling of them, but Dr Salvesen believes that it may be necessary to forbid their sale as far as

certain specially infected districts are concerned. Meanwhile Dr. Thjötta and his associates are collecting material from all over the country in order to study the epidemiology of this disease. Such a study may incidentally throw some light on periodic declines in the rodent population in certain areas.

CHILD STUDY.

THE Child Study Society includes some varied information in the eighth volume of its Journal of Proceedings. The Howard plan and its evolution is the subject of an address to the society by Mrs. O'Brien Harris. Her description of the school at Laura-place, Clapton, with its grouping, in the manner of a university, into various faculties which the pupils attend upon their own responsibility, indicates that latitude may have better results in education than a rigid curriculum. In a lecture on some of the old children's books, Florence V. Barry mentions the publications of John Newbery in the eighteenth century, at the Bible and Sun, St. Paul's Churchyard. In these little books, whose flowery covers were painted by children, a moral was present indeed, but not with the nauseating emphasis found in the books of the next century, and so artfully concealed in the jam as to be palatable. A discussion on nursery schools, opened by Miss Clara E. Grant and Dr. Norman Glaister, is reported in the journal, and the subjects of other lectures are the teaching of Shakespeare in schools, mass methods, co-education, the use of books in school and home, and sunlight in childhood, from which it can be seen that many aspects of child study are attacked with energy and interest. The society meets once a month on Thursday evenings at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1. The hon. secretary, Mrs. I. M. Jarman, B.Sc., can be approached at this address.

LARGE HYDATID CYSTS.

IN our report of Dr. J. F. Brailsford's paper on hydatid disease, read to the British Institute of Radiology (see THE LANCET, Jan. 24th, p. 185), appears a statement that the livers of some of the infected cows seen on his daily visits to the Birmingham public abattoir weighed as much as 200 lb. instead of the normal 14 lb. A correspondent has written to suggest that 200 lb. is a misprint for 20 lb., but we learn from Dr. Brailsford himself that the reported figure is correct "One of the first cases of hydatid disease I saw in a cow 20 years ago," he writes, "had a huge liver which, even after rupture of many of the cysts in conveying the liver to the scales, weighed only just short of 200 lb. The cow was thought to be in calf, but as the calf did not appear and the abdomen continued to swell the animal was slaughtered and the huge hydatid liver was then discovered to be the cause of the swelling."

ACCIDENTS, CARE, AND CAUTION.

MUCH in this world is clearly inevitable, but sickness and deaths due to violence always seem sadly unnecessary. The cause is no faulty gene, elusive germ, or fading hormone; it is something obvious, avoidable. Hence the campaign for accident prevention, which aims at inculcating carefulness and safety-first methods by displaying the results of carelessness. An "accident prevention calendar," lately issued,[1] shows how difficult it is to do this altogether acceptably. The book is good; but in our opinion it lays too much stress on "do not" and too little on "do." Adults as well as children readily react in the negative, and many people resent information intended to make their flesh creep. The road of life may hardly be worth the venture if we must keep looking continuously to right and left.

The calendar states that at least 80 per cent. of accidents are due to no mechanical agency but to personal stupidity and carelessness. It omits to say, however, that in industry it is found that 75 per cent. of these accidents are caused by 25 per cent. of the people performing the particular task concerned. Members of this group seem to collect other kinds of sickness as well as accidents, and they are not highly competent at their work. In fact, this group is an unhealthy group, an unhappy group, ill-suited to its surroundings, and attention concentrated on improving its adjustment would do far more to reduce accidents than efforts to scare the whole community into constant caution. The skilled artisan is heathily active; he has few accidents and he passes by the world's hazards, not unaware, but without a sideways tremor. Formerly such a man was said to possess sound horse-sense, but nowadays we might call it machine-sense. Let us cultivate such a sense and by all means not be foolhardy; but actions are guided better by a healthy than a frightened mind.

[1] Accident Prevention Calendar, 1931. Accident Prevention and Welfare Publications, Ltd., 321, High Holborn, London, W.C

NOTES ON RHEUMATIC INFECTION.

FROM Messrs. Burroughs Wellcome and Co. we have received two little publications having lists of certain of their tabloid preparations which are of tried use in the many conditions implied by the titles. The notes on rheumatic infection in particular are prefaced by a précis of accepted knowledge in regard to acute rheumatic infection in which the problem of cause is very well set out. Beginning with Poynton and Payne's researches, which date from 1900, the claims for the diplococcal streptococcus to be the causal organism of infection are discussed and the support which other bacteriologists have been able to give to the original views is recorded. The way to account for the anomalous findings which have characterised the research in different hands is to hold that acute rheumatism is a hypersensitive state brought about by the liberation of allergising substances from streptococcal foci wherever these may be. The foci are held to arise where allergising substances are produced and liberated to sensitise various groups and cells of the body. The theory no doubt accounts for many of the physical signs which make up what is alluded to in the notes as the acute rheumatic syndrome.

BIRCON CONTRACEPTIVE TABLETS.

WE have received from the Bircon Laboratories, Elarco House, 183, Aldersgate-street, London, E.C., samples of anticonceptive tablets which have been distributed to the medical profession through pharmacists for the last 12 years. The tablets are said to contain chinosol and zinc sulphocarbolate, with a sodium bicarbonate base and other suitable antiseptics and deodorants. When moistened they generate a foam which coats the external os uteri and penetrates the recesses of the vaginal passage, killing, it is stated, the spermatozoa within five seconds. A comparative test, using guinea-pig sperms, has shown Bircon to be more effective than some other chemical contraceptives on the market. Bircon is claimed to be harmless to the mucous membrane, even when used regularly, and it is stated that there is no need for syringing immediately after use.

BERBERINE SULPHATE IN ORIENTAL SORE.

Captain P. V. Karamchandani, I.M.S. retd., has drawn our attention to an ambiguous sentence in his note on this subject (THE LANCET, 1930, i., 78). The text was slightly amended before publication and it was not made clear that Captain Karamchandani had himself introduced the method of treatment he described. His original contribution, entitled an Analysis of 337 Cases of Oriental Sore Treated by Various Methods, appeared in the *Indian Medical Gazette* (1927, lxii., 566).

HULL'S MUNICIPAL HOSPITAL.—A scheme for a new municipal general hospital estimated to cost £285,000 has been approved. It is proposed to build the new hospital on the site of Hull workhouse on Anlaby-road, and to remove the destitute poor to Sculcoates workhouse on Beverley-road.